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Circulation of the Scientific American.

As some of our cotemporaries are questioningthe amount of the circulation of the "Scientific American," we present the following affidavit from our excellent pressman, John A. Gray, Esq., with regard to our present edition. It will be borne in mind that since the commencement of the present volume our edition has been constantly increased in order to keep pace with the constantly increasing subscription. Our regular edition is about twenty thousand, but during the continuance of the Fair there is considerable variation.

[COPY]

"I, the undersigned, John A. Gray, being a practical printer, doing business in the city of New York, do hereby certify that I am the regularly employed printer of the "Scientific American," and that the edition amounts to twenty-one thousand one hundred and twenty copies. JOHN A. GRAY."

New York, Oct. 29th, 1853.

Sworn to before me, this 29th day of October 1853.

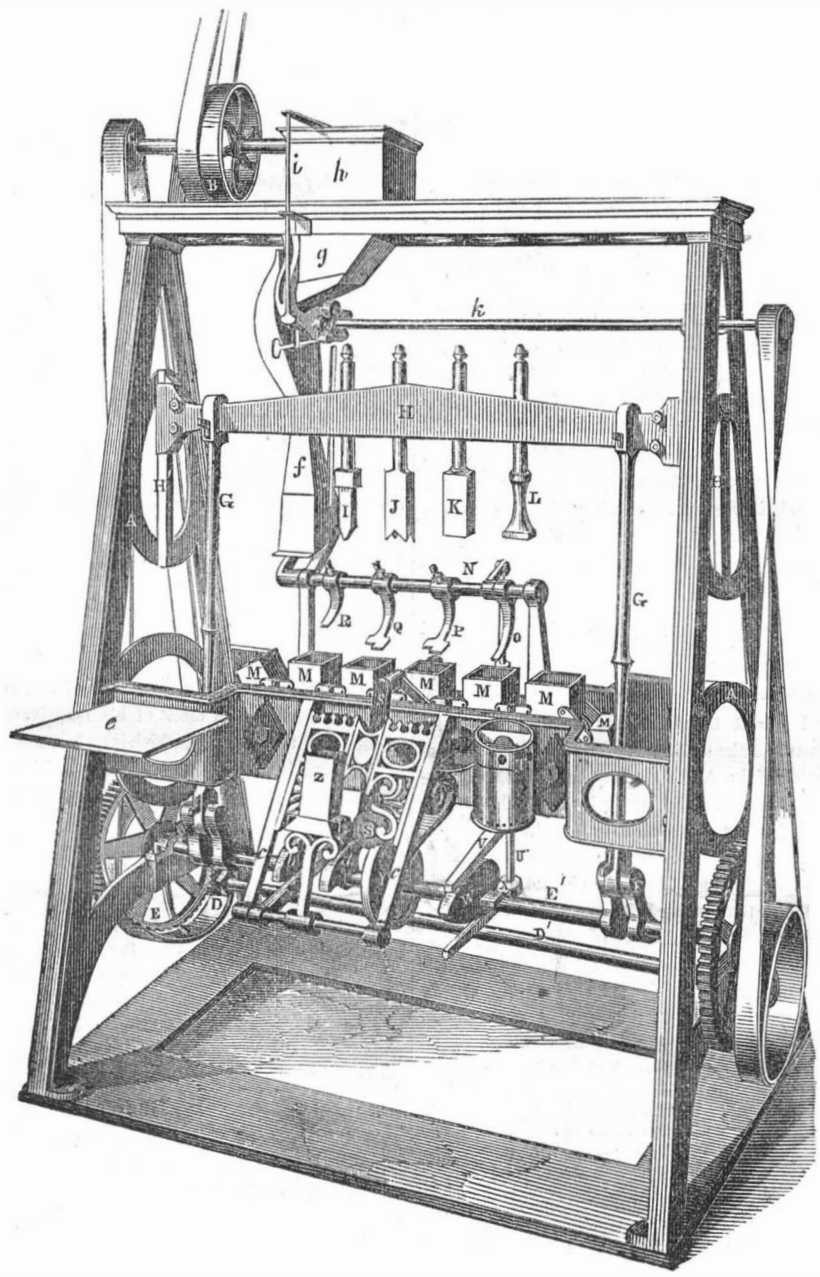
WM. DIXEY,
Commissioner of Deeds, 77 Nassau street.

Recent Foreign Inventions.

CURE FOR SPRAINS, RINGBONES, AND OTHER UNNATURAL OSSIFICATIONS IN HORSES.—A patent has been taken out in England by Joseph Major, of London, to cure the above named diseases in horses by the following composition:—14 parts seneca oil; 4 parts of wood tar; 5 parts of the oil of rosemary; 3 parts of the oil of lavender; 9 parts of the spirits of turpentine. These ingredients are intimately mixed together and placed in an earthenware vessel and then 16 parts of sulphuric acid are mixed with them gradually and stirred until the effervescence has susbsided, when the preparation is complete. The *parts* mentioned are "by weight," In applying this remedy the hair is to be cut from the part affected, and it is put on with a cloth; care must be taken to keep the affected part dry for ten days at least. The animal should also be kept at rest for at least three weeks. What the effect of this horse salve may be we cannot tell; we can only say that the quantity of sulphuric acid is very large, amounting to nearly one half the quantity of the other ingredients, and propably a smaller quantity would answer just as well. The patentee no doubt has tried the mixture and found it to answer well, or he would not be so foolish as to pay the amount required for an English patent.

We invite the attention of our readers to the article on our editorial page, presenting a new plan for building the Pacific Railroad. It proposes to *loan* the surplus funds in the Treasury for this purpose, thus reserving them for the liquidation of the public debt. The company owning the road will be the people, instead of Wall street speculators, and those, too, living on the road, thus insuring friendly feelings from them, instead of an ill-will, which would inevitably result if the road were under the control of those whose only object was self-aggrandizement.

WEIGHING AND PACKING MACHINE.---Fig. 1.



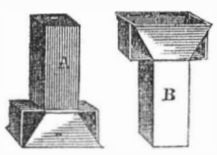
The engraving presented on this page is an illustration of N. B. Harris & Co.'s patent weighing and packing machine, now on exhibition at the Crystal Palace.

In figure 1, A is the iron frame work of the machine; B is the pulley which takes the motion from the driving pulley; C is a small pulley on the same shaft, over which a band passing gives motion to L, a large pulley on the shaft, D, gearing with E on E′, the principal shaft of the machine The substance to be packed is put in the box, *h*, at the bottom of which is the hopper, *g*, having a false bottom that is agitated by the cam wheel, *i*, upon the shaft, *k*, and the ground material passes into the receiver, *f*. The lower portion of this is suspended upon the end of a lever not seen in the engraving, upon the opposite end of which is a weight which may be screwed in and out to set it for different weights of packages. It is evident that when it contains sufficient to overcome the weight of the balance at the other extremity of the lever, it will fall, and by so doing it throws up a jaw that by actuating a rod stops the vibration of the hopper, and consequently the falling of the spices.

But previously to this, a funnel-shaped tin, B, fig. 2, open at the top and bottom, is placed as represented at Z, upon a block connected with the shaft below, and lifted and depressed against the ornamental platform upon the standards *c c*, by the action of the cam, *a*. A paper is laid upon this platform. and as the tin is depressed against it, it is folded around it by the operator, and sealed with some wax taken from the dish, L. It is shown with the paper thus around it, at A, fig. 2. It is then taken off from the block and placed with its funnel end upward in the first of the boxes, M, seen erect at the left-hand side of the engraving.

At this moment the hopper previously mentioned falls, and at at the same time its false bottom opening, the ground spice falls into the funnel. At this period the cam plate, Y, upon the main shaft, E′, acting upon the lever, S, moves forward the endless chain of boxes, M M M, a distance equal to the distances of the

FIG. 2.



centers of the boxes, and the cross-head, H, holding the packers, I J K L is brought down by the connecting rods, G, which are attached to the cranks, F F. At the same time the lifters, R Q, actuated by the cam, W, and the lever V, catch upon the projections seen at figure 2, upon the funnel and lift it partially out of the paper; this is repeated until the paper arrives at the last box but one at the right, when the funnel is taken off by the attendant and the paper is folded down and sealed, after which it is pressed by L, and passes down under the carrying rollers where it is pressed out of the box and falling upon an apron slides away. We have seen this machine in operation, and can assure those interested that it is capable of performing all that is claimed for it by the proprietors It certainly speaks well for the ingenuity of its inventor. For any further information relative to the machine or the right of use, apply to N. B. Harris & Co., Philadelphia.

Improved Car Brake.

Draper Allen, of this city, has invented and taken measures to secure by patent, an improved mode of constructing the brakes for rail cars, more particularly intended for the horse-cars of city streets. It consists in constructing the shoes of brakes in such a manner as to bear not only on the periphery of the wheel, but on the flange also, thus distributing the friction over a greater amount of surface, and at the same time preventing the unequal wear of the wheel, rendering necessary its frequent renewal. It is certainly a good idea.

Improvement in Oil Lamps.

Nathan Buchanan, of Johnston, R. I., has invented a new mode of supplying the wicks of lamps with oil. The improvement is the employment of additional wicks placed by the side of the burning wick, and in close contact with it at the top, for the purpose of supplying it with a greater amount of oil than it is capable of taking up itself. The burning wick is thus rendered less liable to char, and consequently needs less attention. The inventor has taken measures to secure a patent.

New Fire Arm.

C. W. Bontgen, of Newark, N. J., has invented a breech-loading pistol, on which he has applied for a patent. The improvements consist in furnishing the revolving faucet or chamber cylinder, into which the charge is placed, with a spring, in order that it may fly in the position for discharge, as soon as it is relieved of the catch which holds it in the position for loading: and also in furnishing the hammer with a boss of peculiar form, having a recess to receive a spring catch for the purpose of holding the hammer at half-cock.

Improved Stove-pipe Elbow.

Israel Higgins, of Salem, N. J., has invented a new elbow for stove pipes. It is made of cast-iron and is cast in two parts, upon which are small flanges that are united firmly together by means of small bolts. The object is to make an elbow both cheaper and more durable than the common one. We commend it to the notice of iron founders. The inventor has applied for a patent.

Back Numbers Wanted.

If any of our subscribers have on hand Nos. 47, 48, 49, 50, and 52, of Vol. 8, Scientific American, for which they have no use, we shall feel obliged if they will forward them to us, as we have frequent applications for these numbers from subscribers who need them to complete their volumes for binding.

To Destroy Ants.

To drive away ants which infest a house, mix up some fly poison (cobalt) and put it in a convenient place for flies. As soon as the flies are dead and the ants find them, they will leave the house, and if the flies be thrown in the garden the ants will leave there also. A SUBSCRIBER.

Sumpterville, S. C.

Some seeds of the California soap plant have been received in Vienna, Austria. The intention is to try and cultivate the plant there.

The speeches at some of the State Agricultural Fairs by selected orators are specimens of inappropriateness for such occasions.

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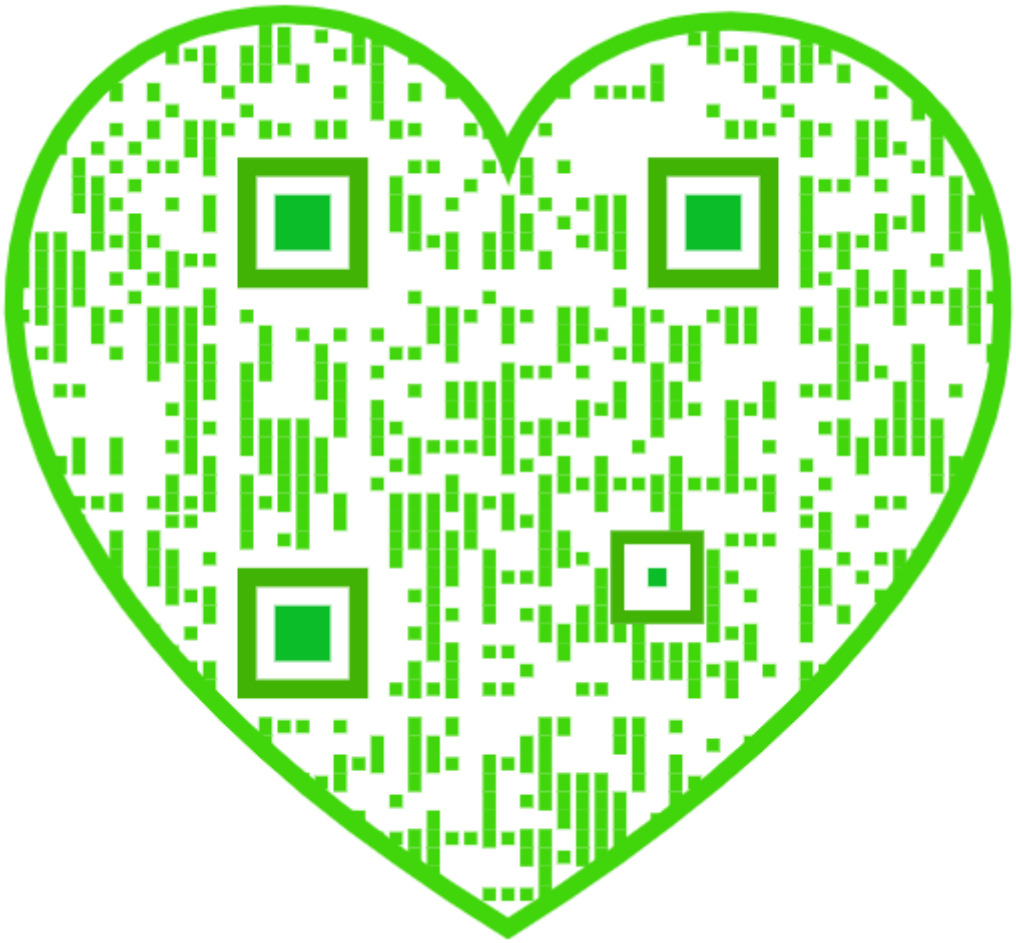

The Influence of Climate and Laws on Our People.

The following is the abstract of a lecture recently delivered in this city by Prof. Smith, on the influence of climate and governments on the national character of the Americans:—

"Old Hippocratus in his essay on the external influences which affect the moral and physical condition of man in the formation of a national character, has carried out his enquiries so admirably that no modern author has been able to improve on them. The form of government under which man lives is eminently calculated to exert an influence on his type of character. The ancient Greeks and Romans held up war as their idol, and looked down with contempt on the less glittering but more useful pursuits of human industry. But not so the Americans—his god is not in the camp; and whereas with the former, peace was the exception—during the existence of this country as a nation, she has spent but six years altogether in war.—Hence it is that America has no equal and no precedent. It would be interesting to inquire whether, since America combined many of the characteristics of the ancient and modern commonwealths, there is in the government of the United States a potentiality which may impart to the American the elegant refinement, the taste, genius, dialectic acumen and rhetorical power of the Athenian—the patriotism and bravery of the Lacedemonian—the noble carriage, spirit, and dignity of the Roman—the commercial enterprise of the Venetian and Genoese—the unwavering fidelity and love of religious freedom of the Swiss; and, lastly, shall I say, the moral courage of the Dutch.

But in the formation of our national character and temperament, there are in action other active moral agencies, besides form of government. The different races of men which are here assembled, under the same political institutions, necessarily modify each other's character proportionately to their respective numbers, and their various degrees and religious elevation of character. The basis of the American population is substantially English or Anglo-Saxon. It was during the reign of the Anglo-Saxon power in England that the principle of liberty began to show that its recognition in human governments was essential to national happiness. From the Norman conquest to the settlement of the United States, that principle in England was more or less shackled by arbitrary rule, and not until the American Revolution was it left free to work out its normal effect in giving character and happiness to a people. Such, then, being the foundation of our national institutions and national character, it must follow that the emigrants coming from other lands than the British Islands must acquire to a greater or less degree, the Anglo-Saxon character. The ethnologist, in surveying the present population and condition of the United States, cannot fail, in view of the diversified effects of climate, to perceive that a uniformity of national physical character cannot exist over so vast an extent of territory. Certain physical peculiarities will even distinguish the population in each of the great national divisions of our country. The people in the east will differ in some physiological respects from those of the West; those of the North from those of the South; those of the Atlantic and Pacific States from those of the great valley of the Mississippi; and those of the elevated mountain region from those of low and champaign countries. It follows that wherever men are exposed to the same physical conditions the same temperament will predominate, and of course give to them a community of character. According to general laws, the dark races occur in tropical climates, the fair under the influence of climates far from the tropics, and the intermediate shades of color under the varieties of temperate climates. The physical temperaments are in a great degree governed by the same laws—the melancholic and choleric pervading in the Southern, and the sanguine in Northern climates. But these varieties of temperament, and also the phlegmatic and nervous, are not as strikingly exhibited on this continent as in Europe. The sanguine temperament and ruddy complexion, though existing in our Northeastern States, are not as fully developed as in Great Britain and the neighboring continental countries. The English, and Scotch, and Irish, after a few years' residence in our Northeastern States, lose their rubicund complexion, plumpness of face, and full sanguine habit, become thinner in person, and acquire a paler color—an intermixture of the choleric temperament; in our Southern latitudes it is less decidedly sanguine, or choleric, and the color swarthy and sallow. Another physical peculiarity is the defective organization and tendency to decay of the teeth. The effect of climate is traceable also among the resident population of foreign birth. An able American dentist observes that "the teeth of Europeans who have resided in this country for a few years, are as subject to decay as our own." In respect to personal form and stature, the Americans may be said to be systematically erect, and inclined to tallness.

These remarks relate more particularly to the population of the Eastern and Middle States, but they are applicable for the most part to the inhabitants west of the Alleghenies. We are told by Professor Drake that over most of the interior valley a ruddy complexion is rare, and often replaced by a slight turbid hue, or a tint of sallowness.

The relations of color and physiological temperament to the elevation of countries above the level of the ocean, corresponds in a good degree with those of latitudes—high elevations in the low latitudes producing the physical phenomena of low elevations in the high latitudes. Accordingly, in the various elevations in the same latitudes are found diversities of complexion and temperament. From this law may be deduced the probability that the elevated plateau and slopes of the Rocky Mountains, in the Temperate Zone—that is, from 40° to 49° W. L., and from 105° to 112° W. L., these being the highest inhabitable parts of the United States—will produce men more ruddy, sanguine, and robust than the native residents of the Eastern Atlantic States. To this physical character of the American may be added their early maturity of body, precocity of mind, versatility of talent, adventurous disposition, and eagerness to gratify a restless curiosity—the two last peculiarities being more characteristic of the Eastern than of the Southern and Western population. "The genius of our countrymen," says an eminent American medical writer, "lies in exaggeration. We must go ahead. There is no resting place for our unquiet people. No principle is worth asserting with any modification; no enterprise worth the undertaking if it have a limit."

[If it is true that races are fair, as stated above, "under the influence of climates far from the tropics," how is it that the natives of arctic regions are so dark in comparsion with the Caucassian races? This is also an interesting enquiry.

A New Method of Modelling in Plaster.

Our readers may have noticed in our list of patent claims of the 3rd ult., page 35, one for a patent on files, granted to our distinguished countryman, Hiram Powers, now residing in Florence. These improved files are most important agents in an improvement in modelling lately invented, and which Mr. Powers, in a letter to the editors of "Putnam's Magazine," briefly describes as follows:—

"The principal tools used in the work consist of chisels, scrapers, and trowels, the blades of which are of gutta percha set in metallic backs, and elastic, so that the plaster can be put on with them somewhat as with a brush, and perforated or open files—every tooth having an opening in front of it, through the body of the instrument, so as to allow the dust and filings to pass through and escape, leaving the teeth unclogged and free to act. The files are of various forms and sizes, being curved, round, flat, &c. The material used is common plaster of Paris.

In projecting a human figure, a pair of irons, reaching nearly as high as the hips, and corresponding in general direction to the bones of the legs, must be set up on a platform, and around these a base must be formed, to hold them firmly, by pouring a sufficient quantity of mixed plaster to produce it. With these for a nucleus, the statue is then commenced to be built up with cores and mortar. The cores are made by pouring a quantity of plaster on a piece of oil cloth, and as it begins to harden, scoring it deeply with a knife or chisel, so that when quite hard it may be easily broken into fragments of a desirable size. Courses of these cores are built up around the irons, and above them, until finally the entire body is finished in this rough manner, the layers being cemented together by plaster mortar. The chisels are then brought into play for the purpose of roughing the figure (consisting of legs, body, and head,) into the general human shape. A long core is then dipped in fluid plaster and the end applied to the shoulder. It soon adheres and forms the nucleus of the upper arm. To it another core is attached to form the fore-arm. When these are filled out with plaster, the whole body is covered with a coating of the same, and the files brought into use, which soon produces an even surface, taking off all irregularities.

The advantages of these models over the ordinary clay models which are generally constructed, are, 1st, a clay model cannot be changed materially after it has once been commenced, for the iron skeleton which sustains every part of it is a fixture; but in the plaster work the iron frame is only in the legs, and all the rest can at any time be cut apart and varied from the original design in accordance with any after-thought of the artist. The plastering neither shrinks nor swells from exposure, and does not require wetting or covering with cloth to keep it in order. The process is less tedious than clay modelling, for by means of the open files more can be accomplished in a day than with clay in several days. And again, no moulding is necessary to transform the form from clay to plaster; the plaster figure, as it came from the artist's hands, is itself the model. Mr. Powers says modelling in plaster is not new; he only claims his way of doing it as new. He considers the chief merit of his contrivance to consist of the open file, which is an instrument of his own invention, and by aid of which a high perfection of finish can be easily attained.

Adulterated Cream of Tartar.

A very large portion of the cream of tartar used for domestic purposes, and what is even worse, much of that used for medicine is badly adulterated. A writer in the "Boston Journal" says that an examination lately made of six specimens showed in the purest sixty two per cent. of foreign matter. The consequences are unwholesome bread and inoperative medicine.—We learn from an extensive dealer in the article that three barrels of alum and three of flour were lately sent to a mill in Boston, with instructions to be manufactured into cream of tartar, and to be labelled with the name of the manufacturer. The man refused to place his label on a spurious article, and the raw material was sent to some more compliant person.—Ground cream of tartar is sold in many of the shops lower than the crystalized can be afforded, and is of course adulterated. Grocers should be very careful in their purchases and housekeepers should be quite as careful. The writer in the "Boston Journal" says of the specimens analyzed:—

"The added ingredients consisted of white sand, ground pumice, ground rice, and flour.—This is a vile compound to offer to a sick child or an adult invalid.

If the purchaser will provide himself with a small phial of the solution of iodine, and place a drop in connection with the suspected article the presence of flour or any article containing starch, is instantly shown by the blue tint which follows. Let him place a few grains in boiling water, and if it is not entirely soluble, let him reject it. An experienced dealer can always judge with a great degree of accuracy by the appearance of the article. Pure cream of tartar is intensely white, and has a degree of moisture and cohesion about it entirely unlike flour, or any of the articles used to adulterate it."

These are startling statements. Many persons, we believe, use cream of tartar and the bicarbonate of soda for raising bread; let them see to it that these ingredients are pure before using them, and not upon any account use those respecting the purity of which they have a single doubt, either mixed together or sold separately.

Carpet for the President's House.

It is stated that a gorgeous carpet has just been finished at Glasgow, Scotland, for the White House at Washington. It measures 80 feet long by 40 feet broad; the portion woven in the loom without a seam being 72 feet by 31 feet and the remainder consists of a handsome border sewn on. The filling in of the carpet is a ruby and crimson damask, with three tasteful medallions in the centre, and a rich corner-piece to correspond. The medallions are filled up with boquets of flowers, designed and executed with magnificent taste. The entire piece weighs upwards of a ton, and is valued at $2,500.

It would have pleased us more if such an order had been filled at home. The President has nothing to do with it, as he is not the person who furnishes the White House, but a Committee appointed for the purpose. We do not believe there is a single carpet loom in our country fit to manufacture such a wide carpet, but a narrow carpet might have sufficed.—Queen Victoria and all the members of foreign goverments patronize their own manufactures. With private persons we have no business to say a word respecting whom they shall buy from, but this is a different case, and it is not out of place thus to express our opinions.

The Telegraph and Electricity Applied to War.

One of the recent experiments in Europe is the application of electricity and the electric telegraph to the purposes of war. It is stated that during the field day at Olmutz, on the 26th at which the Emperors of Russia and Austria were present, a sham fight on a grand scale, the siege of the citadel, including the application of electricity on the most recently approved principles of ignition and combustion, constituted the most important of the manœuvres which were practised. A Vienna paper describes three omnibus looking vehicles, which were in the camp, each containing a complete electric apparatus, with a contrivance for laying an insulated wire along the ground by the mere locomotion of the vehicle, the wire being so protected as to remain uninjured by the pressure of the heaviest artillery passing over it. By this means orders are to be instantaneously conveyed from the Emperor's station, and that of the chief commander to troops at almost any distance on the field of the manœuvres.

Our Prospect.

We must certainly return our thanks to our friends for the kind words they have spoken for us, for new subscribers are pouring in upon us by scores and by hundreds from the length and breadth of our land. We commenced this volume with an edition of several thousand more than our subscription, but we have already been under the necessity of announcing our first numbers deficient. But where so many are thus gratuitously serving us, we are surprised that there is so little competition for our prizes. There have been a few who have given us quite respectable lists, but yet we are confident that a few days labor in any of our large towns and villages, might secure even the largest of our prizes. When we announce our prize list we are confident that there will be many who will regret their sluggishness in this respect.

A Chicago Locomotive.

The first trip of a locomotive built west of the Allegheny mountains, was made on the 15th ult. at Chicago, where it was built at the Locomotive Works of Scoville & Sons. The engine was named on the occasion, very appropriately the "Enterprize," and run at the rate of 60 miles per hour, on a portion of the Galena and Chicago Union road.

Extent of London.

The capital of the British Kingdom, it is said extends over an area of seventy-eight thousand and twenty-nine acres, or one hundred and twenty-two square miles, and the number of its inhabitants, rapidly increasing, was two millions three hundred and sixty-two thousand, two hundred and thirty six, on the day of the last census.

John Delafield, the able President of the New York State Agricultural Society, died at Geneva, N. Y., on the 25th ult.

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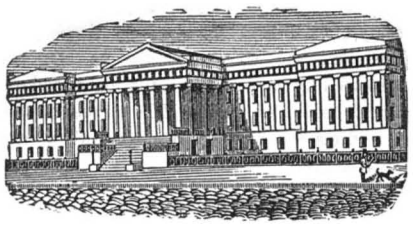

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING OCTOBER 23, 1853.

WINDOW SHUTTER, FASTENER, AND HOLDER—By Calvin Adams, of Pittsburg, Pa.: I do not claim the construction of the shutter fastening, nor the use of the latch and pin, as used for fastening shutters when closed, nor otherwise than in combination with the contrivance for bowing shutters.

I claim combining with the latch or bolt of an inside shutter fastener, a contrivance for securing the shutters in a partially opened position, by means of the rings and arm, in combination with the latch and pin, substantially as set forth.

SELF-ACTING BAR EXCAVATORS—By G. T. Beauregard of New Orleans, La.: I claim the bar excavator in which the surface current by means of the inclined planes is deflected downward and made to act upon the bar, the whole being arranged and operated as described.

DEVICES OF A CONVERTIBLE DUNG FORK—By Ezra H. Dawes, of Litchfields, Me.: I claim making the tines of ordinary dung or hay forks, to revolve upon the handle, as set forth.

PROPELLING VESSELS—By F. P. Dimpfel, of Philadelphia, Pa.: I claim the arrangement of the water passages, apertures, and valves in combination with a reciprocating piston and its chamber, substantially, as set forth.

LOUNGES—By Augustus Eliaers, of Boston, Mass.: I claim the parts which form the support to the upper part of the body in lounges or other similar articles of furniture, upon springs and hinges, as described, so as to vary its inclination at the pleasure of the occupant the said support being fastened and held in any desirable position, by a set screw and curved arm; as set forth.

LIBRARY STEP CHAIRS—By Augustus Eliaers, of Boston. Mass.: I claim a library step chair or a chair which may be changed at pleasure into a flight of steps, in which the fold or hinge of the two parts is formed in the top or an extension of the front leg of the chair, thereby permitting the seat to be so stuffed as to form an ornamental and comfortable chair, and when opened to form a flight of five steps, as set forth.

BEE HIVES—By Wooster A. Flanders, of Sharon, Vt.: I do not confine myself to the peculiar construction described, but I claim the adjustable passage by which the entrance to the hive may be enlarged or diminished in the manner set forth.

ATTACHING HORSES TO PLOWS—By John D. Filkins & W. H. De Puy, of Lima, Ind.: We claim the combination of the limber and stiff tongues with the running gear, to adapt it to being drawn by two teams abreast, as described.

CUTTING AND PLANTING POTATOES—By Samuel Hutchinson, of Rockport, Ind.: I claim the construction and combination described, of the cam, sliding platform, cutting blade, and trap doors, with the furrowing share and covering blade, for cutting, dropping, distancing, and covering potatoes.

WINNOWERS—By David S. Mackey & J. R. Smith, of Batavia, N. Y.: We claim, first, the peculiar manner of operating the screen, viz., by means of the eccentrics placed in a reverse manner upon the shaft, said eccentrics working between the blocks attached to the under side of the screen, as described.

Second, we claim producing two blasts from a single fan, and having the two blasts cross or intersect each other, by which a blast passes horizontally over the top of the screen, and a blast also passes upward through the screen, preventing the screen from being clogged or choked by the chaff.

[This is a very good improvement.]

MACHINES FOR DRESSING STONE—By E. G. Matthews, of Troy, N. Y.: I claim the driving apparatus for driving the cutters, said apparatus being formed or constructed of the driving wheel and friction wheel, arranged as specified, in the frame attached to the driving rod, by means of which rod a reciprocating motion is given to the said frame, which causes the driving wheel to roll back and forth, on and over the heads of the cutter stocks, thereby causing the cutters to make the desired cut in the stone, the friction wheel meanwhile rolling on the periphery of the driving wheel, and also in a groove in the cross bar, as described. I do not intend to confine or limit myself in this claim, exclusively to the use of one friction wheel, but hold myself at liberty to use one or more, and to vary the arrangement of them, while the principle of driving the cutters as described is substantially adhered to.

Second, I claim the rocking bar, with inclined planes at each end, in combination with the cutter stocks, and the roller or its mechanical equivalent attached to the frame of the driving apparatus, for the purpose of rolling or striking on the inclined planes of the bar, as the driving apparatus reaches the end of its stroke, so as to rock or tip the bar, thereby causing the inner edge of the bar to catch or stroke under the shoulders of the cutter stocks, and raise them up in position for the driving wheel to act upon them in its return stroke, substantially as specified.

SHIPS' SIDE LIGHTS—By Charles Perley, of New York City: I do not claim sliding a glass or light sideways in a frame, as that has been done, but I am not aware that any box has been so fitted as to contain a side light, and form a receptacle for leakage, passing the same out by a small hole or holes thereby effectually preventing any water from passing into the ship.

I am aware that india rubber has been used as a packing for side lights, therefore I do not claim the same.

But I claim the means described for preventing any leakage from a side light passing into a vessel, by enclosing the side light in a metallic box, let into the side of the vessel, and provided with a small hole or holes to pass out said leakage, as specified.

VALVE-GAUGE FOR BOTTLES—By Alphonse Quantin, of Philadelphia, Pa. I claim the machine or gauge, with the arrangement of the valves, as described, one opening by the act of closing the other, so as to pour out of the vessel to which the gauge is attached only the quantity of liquid contained in the space between the two valves.

METALLIC PISTON PACKING—By H. L. Russell, of Hudson, Mich.: I do not claim the metallic bands, for they are now used in metallic packing.

But I claim expanding the metallic bands which encompass the drum, by means of the levers placed in the periphery of the drum, and operated by means of the ring, within the drum, as described. the ring being prevented from moving casually by means of the coil spring ratchet, and pawl, or their equivalents.

[See notice of this invention on page 20, this Volume Sci. Am.

MAKING SHOVELS, SPADES, &c.—By Wm. W. Richards, of Philadelphia, Pa.: I claim as a new manufacture, shovels, spades. and other implements, made of a composite sheet of metal. whose constituents are parallel laminæ of unequal hardness, as set forth.

But I make no claim to such implements made of the hard lamina extending for a short distance only above the edge, but only where it extends up beneath the strap to support the back.

EXPANDING HORSE SHOES—By B. P. Sargent, of Sutton, N. H.: I claim the combination of the bearers or ears, with the jointed quarters or bars, jointed together or to a common toe piece or cork, and operated by an expansion screw or contrivance, as specified.

GARDEN AND OTHER HOES—By J. T. Sargent, of Sutton, N. H.: I do not claim the employment of a screw and nut for confining two things together: nor do I claim the attachment of the shank and blade of a hoe by means of the bearing plates welded to and forming part of the shank, and rivetted to the blade.

But I claim my attachment of the blade and shank, whereby the blade not only can be readily removed from or as readily confined to the shank, but when affixed to it is prevented from breakage where the greatest leverage or strain is brought upon it, meaning to claim the bearing head, fixed firmly to and making part of the shank the movable plate or stiffener, or its equivalents (applied to the back of the blade and made separate from the shank), the screw on the shank, the screw nut, and the recess in the hoe blade as combined together and with the shank of the handle and made to operate, as specified.

SPRING CLAMPS FOR CLOTHES-LINES—By D. M. Smith, of Springfield, Vt.: I do not claim a mere clasp composed of two levers hinged together between their respective ends, and having a spring placed between their two adjacent arms.

But I claim the described improved clothes pin, that is to say, I claim the arrangement of the line opening, and the spring, on opposite sides of the hinge of the two levers, all as specified, whereby, by pressure of the longer legs of the levers between the thumb and fingers of the hand of a person, the instrument is rendered very convenient of application without danger, during the same, of tearing the clothes secured by it on a line.

PROPELLERS—By James Trees, of Salem, Pa.: I claim the combination with submerged propellers, whose area where the water enters is greater than the hinder extremity where the water escapes of helical blades or vanes, and a tapering shaft to which they are attached, both the blades and shafts tapering from point to rear, as set forth.

OX YOKES—By Albert Vose, of Pittsfield, Vt. Antedated Aug. 10, 1853: I claim, first, the construction of the semi-revolving neck blocks, each having a curved groove and pin fitting into it for enabling the neck block to always adjust itself at right angles to the direction of the neck of the animal.

Second, I claim, in combination with the groove in the neck block the use of the pin subserving the double purpose of controlling the movement of the neck block, and adjusting the length of the yoke, as described.

CUTTING THE BARS AND TEETH IN CURRY COMBS—By Wm. Wheeler, of West Poultney, Vt. (assignor to Chas H. Kellog, of Troy, N. Y.): I claim the method of forming the bars of curry combs, by punching them out of plates, so that at a single operation a strip of the proper width for the bar is severed from the plate, and one row of teeth cut thereon, and another row upon the end of the plate for the next bar, as set forth.

SODA FOUNTAINS—By Wm. Coughlan, of Baltimore, Md. I claim the auxiliary faucet or valve, for the purpose of enabling the fount to be filled with prepared mineral water, as described.

ATTACHING THE HEAD CRINGLE TO THE YARDS OF VESSELS—By Nelson Crocker, of Sandwich, Mass.: I claim the head cringle hooks and their fixtures constructed and combined with the rigging of a vessel, as set forth.

SEED PLANTERS—By N. C. Davis, of West Jefferson, O. I claim the piston provided with a notch or hollow, in its upper end, and so arranged in combination with the partition, and depression, that it will bring up and discharge through the aperture, the desired number of grains of corn every time it is raised by the operator, as set forth.

MACHINE HAMMERS—By Daniel Noyes, of Abington, Mass.: I claim, first, a machine for hammering iron, &c., having the distinguishing features enumerated, viz., a hammer for giving the blow upon the upper surface of the iron acting in conjunction with two hammers, which simultaneously strike the sides of the iron, as set forth.

I further claim, in a machine for hammering iron, the use of these two side hammers operating as specified, whether used in connection with the upper hammer or without it.

Second, I claim so arranging the relative position of the fulcra of the hammer beam and the ends of the connecting rods attached to said beams and to the crank shaft and gears, from which they derive their motion, as to bring the said fulcra and connecting rods in nearly a straight line at the time of giving the blow, for the purpose specified, the opposite ends of the connecting rods just before giving the blow, moving in opposite directions, so as to give a rapid and powerful blow.

Third, I claim causing the anvil to descend from the iron just before the blow of the side hammers, and to ascend just before the blow of the upper hammer, by means of a rod attached at one end to the under side of the upper hammer beam, and at the other end to a tilting arm, which embraces the anvil, as described.

SCREW NAILS—By Samuel Pratt, of Boston, Mass.: I claim a screw nail constructed with a thread shaped as described.

I also claim shaping the head, as set forth, so that the battering caused by the driving will not obstruct the application of the turn screw.

SPARK ARRESTER—By Samuel Sweet, of New York City—I make no claim to originality of invention in the individual parts of the spark arrester, separately considered.

I claim the combination of the reticulated inverted frustums of cones, constructed and situated as described, with the trumpet-shaped deflector and guard, the reticulated cylinder, under the opening provided with the reticulated valve, when these parts are arranged in the upper portion of an enlarged or expanded external pipe, the whole operating as set forth.

[This invention is fully illustrated and described in Vol. 8, page 108, Scientific American, and are now being extensively made in this city by the patentee. It is believed to possess all the qualities for which it is designed, and so far as it has been tried it operates perfectly, not a spark escaping. How important this is to the railroad companies as, almost daily we hear of some conflagration arising from escaping sparks. If this invention accomplishes all that is confidently claimed for it, it should be generally adopted at once.

LOOMS FOR MAKING WEAVERS' HARNESS—By Kasimir Vogel, of Chelsea, Mass.: I do not confine myself to the precise details set forth, but I claim the combination of the loom for weaving the borders of the harness, with the press, for securing the metallic eye upon the threads of the harness without a knot, braid, or loop, as described.

DESIGNS.

COOKING STOVES—By N. Putnam Richardson, of Portland, Me.

REGISTER—By J. A. Read, of Philadelphia, Pa., assignor to Wm. W. & Charles M. Atkins.

Bonnell's Patent Flouring Process.

[Concluded from page 51.]

The auxiliary mill should be adapted in size to the amount of offal to be ground and fitted up with great care, so as to ensure perfectly uniform and equal feeding. They should be faced and "cracked" fine and smooth, with furrows of good depth about the eye, and made true and smooth also. If the common kind of stone are used, the eye in the runner should be made conical, to ensure good feeding, and the runner wnll balanced when in motion.

This process may be adapted, in like manner, to custom work or common grist grinding, with equal success as in flouring or merchant work.

In grinding, by this process, the first grinding should be done something "higher" or coarser than when attempting to make "close work," by the usual mode, so as always to avoid reducing the starch contained in the wheat, too fine, yet it should not be ground so coarse as to prevent the first bolts from sifting out a good proportion of the flour in the wheat, as this would throw forward too much grinding on the auxiliary mill, and both the grinding and subsequent bolting would be less perfect. All should be pulverized at the first mill that can be without danger of glazing the stones, clogging the bolts, or rendering any of the particles too fine, or producing too great heat. And in grinding the offal at the auxiliary mill, care must be taken, also, not to grind too fine. It should be ground even and fine, but if too fine, the large amount of gluten and fatty matter found in the offal, will glaze the stones and also "varnish" over and "clog" the bolts, unless judgment is used in grinding and the mills work in a proper manner. The directions given in the foregoing specification will be readily understood by any ordinary practical miller, and it is not expected that they will be followed to the letter in every instance, but may be varied in application, or similar devices resorted to which will answer the same end, according to the condition of the mill, circumstances, and judgment of the miller.

The advantages obtained by my process, or the main features of them, may be shown by presenting them in the following manner and connection:—

1st. As about 60 per cent. of the flour is taken from the ground meal or wheat by the first grinding and bolting, there is no obstacle to the second grinding perfectly cleaning the offal and pulverizing the glutenous matter.

2nd. The coarse particles that escape the first grinding and pass out at the tail of the first bolts with the offal, being all reduced to proper fineness, there is none of the coarse "returns" sent back to the superfine bolts, but being reduced to flour consistence, it is bolted through 9 or 10 cloth before returning it, when it will readily incorporate with the superfine flour by bolting through the same quality of bolt cloth, No. 9 and 10 being generally used on the superfine bolts.

3rd. The starch and gluten may be ground to an equal and sufficient degree of fineness, without danger of reducing any of the more tender parts too fine, which ensures rapid and frec bolting, and hence a saving of the amount of bolts required.

4th. The granular or gritty property of the flour being preserved, as the miller is enabled to grind high or fine in the first grinding, and without the usual loss of the nutritive property of the grain; it ferments more readily, will make just as white, sweeter, healthier, and better bread, with more of it to the given quantity of flour, as it contains more gluten; will absorb more liquid and bleach better in baking.

5th. In grinding wet or damp wheat, the first grinding must be high or coarse from necessity, and the loss sustained by the old mode is greatly reduced by grinding all the offal. The first grinding heats or warms the product, and by passing up the elevators through the cooler, bolts, conveyors, &c., the offal, by the action and exposure to air, becomes partially kiln-dried, and on reaching the auxiliary mill is divested of nearly every remaining particle of flour, while in this condition, without difficulty.

6th. It tends somewhat, by being twice warmed or heated in grinding, to evaporate more of the moisture found in the grain, and renders the flour drier, and by largely increasing the yield, adds more of the gluten to the flour.

7th. It avoids any danger or necessity of glazing the stones, and by preserving them much longer in a good grinding condition, time and labor is saved in dressing.

8th. It finishes the business by a straight and continuous operation, and enables the miller to make a high "extra" article of flour from the first grinding, and any desired quality from the second, all at the same time, without extra labor and without the usual loss in wheat formerly sustained in making "extra" flour, but with great gain in the quantity required to the barrel.

9th. The mill, with this process properly adapted and managed with judgment, will produce a barrel of good superfine flour, on an average grind from four bushels of good clean wheat, weighing 60 lbs. to the bushel, and it has been produced from 3 55-60 bushels, leaving only 39 lbs. offal and loss per barrel, whereas, by the old mode, the offal and waste to the barrel is seldom less than 59 lbs., and often from 65 to 70, and in many parts of the country, even more than that.

10th. By this process all the white varieties of wheat may be made into "fancy flour," and a barrel produced from 4 bushels; or 4-5ths into "extra," and the rest in "No. 2 superfine," or "Improved Graham," if desired.

What I claim, as my invention and improvement, is the process of grinding the offal of grain, immediately after it has passed from the bolts, contemporaneous with the first flouring. And by the continuous operation of machinery adapted to said process, substantially as set forth, for the purpose of increasing the quantity and improving the quality of the "superfine" or other flour. DAVID P. BONNELL.

Indianapolis, Ind.

Crossing the Ocean in Six Days.

We have received a letter from J. W. Griffiths—the able nautical architect of the "Wm. Norris," the steamship which is now building to cross the ocean in six days—in which he says, we should give the formulæ for the opinion we have expressed in allowing this vessel 8½ days to cross the Atlantic. He says, "if you will look into the matter you will discover that the distance between New York and Gálway is about one day's less sailing than to Liverpool and how could the "William Norris" be entitled to the *broom* if she required as much time to make the passage as the Collin's steamers in running the same distance." From the statements which had been made about this vessel, we understood that Mr. Norris had said that it would make the voyage from New York to Liverpool in six days; or more than four days less than the Collin's steamers, which would require an average speed of 21 miles per hour. To make the passage to Galway from New York in six days, it will require an average speed of 18¾ miles per hour. The "William Norris," Mr. Griffiths informs us, will have 40 per cent. less resistance, and her load line but one quarter of that of the Baltic or Pacific, while the steam power will be as high." The steam power, then, according to the tonnage (750 tons) will be four times more than that of the Collins steamers, with 40 per cent. less resistance beside. There is certainly a very great difference of opinion among engineers respecting the ratio of power required for every increment of a steamship's speed. Some maintain—Scott Russell among the number—that it only requires a quadruple increase of power to double the speed, that is, according to the square; while others maintain that it requires an increase of eight times the power—the cube—to double the speed. According to the first formulæ, the "William Norris" will be able to make the voyage to Liverpool in five days. To make a voyage of six days, this new steamship will have to use more than half her tonnage of coal, namely 423½ tons—or over 71 tons per day. There are so many items to be taken into consideration in calculating the probable time in which the "William Norris" will make the voyage across the Atlantic, that we anticipate an addition to our stock of information by this vessel's performance, and await the result to confirm or confute the preconceived opinions we have expressed, opinions which have been founded on some experience and observation. If engines of six horse-power to the ton were placed in a ship of the same size as the Atlantic, we certainly would have far greater hopes of such a steamer making the voyage in six days, than such a small vessel as the "William Norris,"—the wave resistance is much greater in proportion to a vessel of small than one of large tonnage.

The swiftest boats on the North River, when urged to their greatest running speed, never go faster than 20 miles per hour.

The ship Great Republic is one hundred and five feet longer than the height of the Bunker Hill Monument—the latter measuring 220 feet, and the Republic 325 feet.

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New Inventions.

Improved Threshing Machine.

J. L. Garlington, of Snapping Shoals, Ga., has invented a new threshing machine constructed as follows: a series of beaters are arranged tangentially around the face of a vertical revolving disc, and another series are arranged radially around its periphery. These revolve within a stationary concave, having a series of strippers arranged tangentially on the inner face of its sides, and another series placed radially for a short distance around its inner periphery. This disc is kept close against the stationary strippers by a spring, and is thus made to press constantly against the straw though it may be fed in unequally. Several important advantages are claimed for this invention. A patent has been applied for.

Improved Barrel Machinery.

Joel. P. Heacock, of Marlboro', Ohio, has invented a new manner of making the heads of barrels by machinery, and has applied for a patent on his invention. It consists in the employment of two jaws for holding the stuff of which the head is to be formed, and of a double edged V-shaped adjustable cutter, which is attached to a swinging lever and moved back and forth in the arc of a circle, from a horizontal to a vertical position, thus giving the proper circular shape and bevel to the barrel head. Truly the days of hand-coopering must be nearly past.

Folding Bedstead.

Mrs. Sarah B. Collier, of Fall River, Mass., has invented an improved folding bedstead; the head and foot-boards, and end rails are each made in two parts, and are united by hinges, and are also hinged to the posts in such a manner that, when the bedding is removed, by pressing the centers of the ends inwards, the whole bedstead will fold together compactly, occupying no more space than is actually filled by its parts. It is certainly a very ingenious contrivance of its kind. The inventor has applied for a patent.

Stone Dressing Machine.

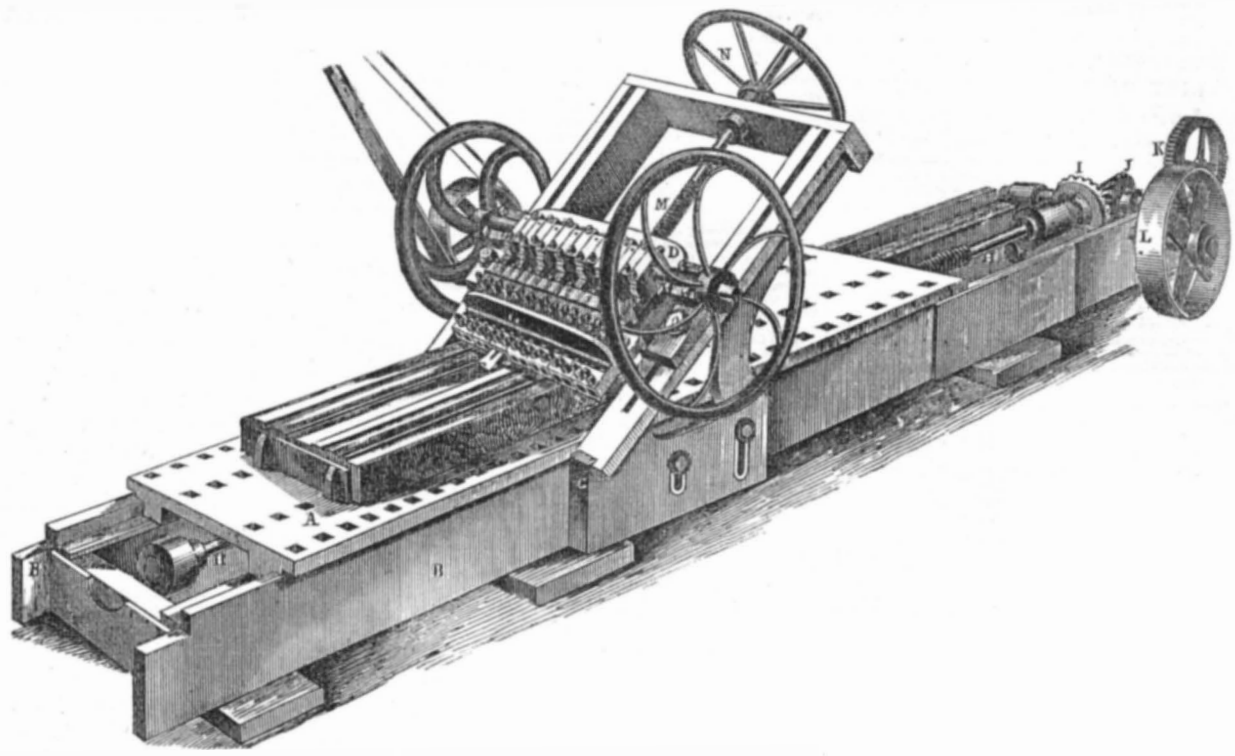
The annexed engraving is a perspective view of Eastman's chisel reciprocating stone dressing machine on exhibition at the Crystal Palace.—The inventor is Robert Eastman, of Concord, N. H., to whom a patent was granted on the 20th of July last year, patents have also been secured in the principal kingdoms of Europe. The cutters of this machine are a series of chisels arranged on a shaft, each one on a small eccentric or crank placed a little out of line with its fellow, so that by revolving the shaft, the chisels act upon the stone placed beneath and fed forward to them, with a reciprocating motion identical with the hand method of hewing stone.

A is the sliding bed on which the stone is secured by dogs; it is similar to that of an iron planing machine; B is the horizontal bed frame for supporting the whole machinery; C are the side plates for supporting the frame of the cutting chisels; D are a series of chisel boxes secured on the transverse shaft, E. Each one of these boxes is secured on a crank or eccentric, and out of line with one another, so that when the shaft is revolved they strike separately and not all at once, thus preventing jarring, injuring of the stone, and make the machine work easier. The chisels are secured by nuts at the lower end G, of the boxes; F is one of the chisels; no others are shown. As many or as few chisels as may be desired can thus be used. On the stone shown in the frame, the chisel, F, will cut a groove, and if all the chisels were in a line, a smooth surface would be cut on the stone, and if one chisel projected farther than the rest, a groove would be cut in the stone, if two projected two grooves would be cut. The chisel frame can be set and secured by the screw bolts to work at any angle against the stone. The cutters can be elevated or lowered for thick and thin slabs, by the screw shaft, M, worked by wheel N. A groove is shown in the cutter frame, in which the boxes of the shaft, E, slide to any position. There is a fly wheel on each side of the cutter shaft, and the band which drives it is shown at the left hand side.

H H is a longitudinal screw shaft. It is revolved by the bevel gearing, I J, is operated through the wheel, K, which is driven by a pinion on the shaft of the driving pulley, L.

The screw shaft, H, works in a nut on the under side of the stone bed and moves it forward by revolving in one direction, and vice versa. The construction and operation of this machine will now be clearly understood. We have seen it cutting one of the very hardest blocks of marble with great ease, rapidity, and beauty of execution. It is a very simple machine, and the chisels endure as long as those used by hand, are as easily made, and require no more sharpening. The chisels can be set to dress stone facing, reeding, fluting, and

EASTMAN'S STONE DRESSING MACHINE.



mouldings. There is another stone dressing machine of Mr. Eastman's, on exhibition, an engraving of which will appear in our next number.

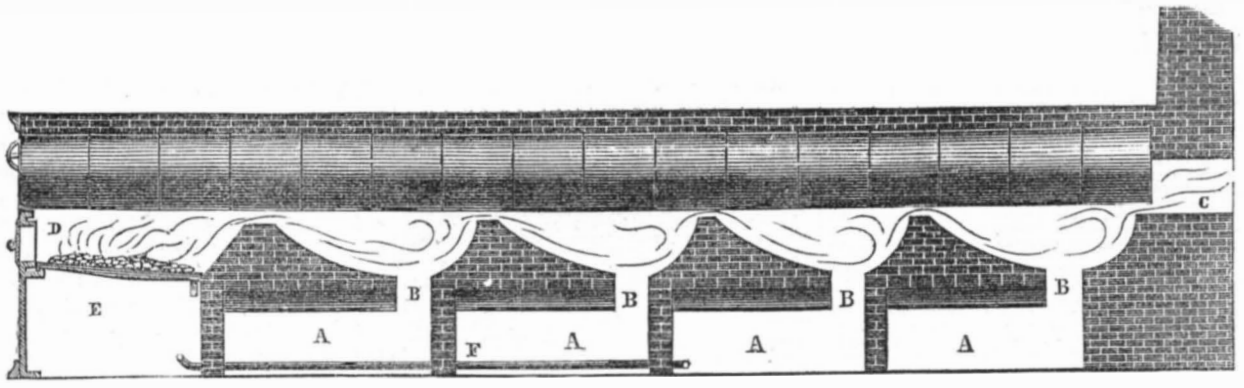
The assignees of this machine are Seth Eastman, and B. H. Cheever, Washington, D. C., Jos. Greeley, Nashua, N. H., and Darcy E. Bolton, of Coburg, Canada West, from whom more information may be obtained by letter, and all those who visit the Crystal Palace can obtain information on the ground. This makes four stone dressing machines which have been illustrated in our columns. In this number we have illustrated three important inventions on exhibition at the Crystal Palace, thus adding new testimony to the truth often uttered by our inventors, "the Scientific American is the Repertory of American Inventions."

BAKER'S IMPROVED FURNACE.

The annexed engraving is a longitudinal vertical section of the improved Steam Boiler Furnace of Henry F. Baker, of Boston, and for which patents were granted both in the United States and in the principal kingdoms of Europe some years ago. Since it was patented, ample time has elapsed to test the merits of this invention, and it has been submitted to the touch stone of many experiments, both at home and abroad, and it is said has earned for itself a good character.

The improvement consists in the formation under the boiler of a number of reverberatory chambers which retain the unconsumed gases and cause them to revolve, and at the same time this motion causes the flame and the whole heated currents to impinge on the bottom of the boiler, and impart a far greater amount of heat than can be obtained by other furnaces.

In the engraving a long tubular boiler is represented with this furnace under it. A A represent a series of arches under it; each one is connected with the fire draft space, B, so as to



form a series of ovens under the boiler. The reverberatory motion given to the heated products is obtained by the fire bridges and inverted arch spaces between them. The space is very narrow between the boiler and the crown of the bridges; the spaces communicating with the hollow arches are 12 inches wide each, and the throat into the chimney, at C, is only two inches between the back wall and the end of the boiler; D is the furnace; E is the ash pit. The air is fed into the ash pit by a pipe, F, which takes the air from the outside, and by passing through the ovens near the bottom, is found to supply hot air to the fuel.—With this explanation any person will understand the principles upon which this furnace is constructed and operates.

It is claimed for this furnace that it is smoke consuming and that it affects the same objects as a tubular boiler. The principle claimed as Mr. Baker's discovery, is that whatever form of boiler is used, *time* is the essential element of its efficacy and economy—that an increase of heating surface is of no avail, except as it keeps the heated air longer in contact with the boiler, thereby imparting the heat more effectually to the water. The smoke which is often seen escaping from chimneys is carbonic oxyde, and fine solid particles of coal, all this is loss, for it would burn and give out a great deal of heat. Besides being a dead loss of fuel, smoke is very disagreeable and unhealthy. To consume the smoke, therefore, it is necessary that it should be sufficiently supplied with oxygen, and there should be sufficient intensity of heat to ignite it when so supplied. The great error committed in all the smoke-consuming furnaces heretofore produced, was in bringing in fresh air to supply a sufficient quantity for the smoke, instead of endeavoring to make the common air of the draft answer the purpose. This furnace is constructed on the latter principle. By retarding the heated gases under the boiler, sufficient time is allowed for the air to mingle with the carbonic oxyde to saturation and it is all ignited and inflamed before it reaches the end of the boiler. There can be no doubt but near one half of the oxygen passes through our common furnaces without entering into combination with the carbon and hydrogen in the fuel. Every pound of coal requires 2 pounds of oxygen for its saturation, but owing to the rapid draught of furnaces in general, about four pounds of oxygen for every pound of fuel consumed, passes through the furnace. What a loss is involved here.—Flames are often seen belching out of the funnels of steamboats and the chimneys of steam boiler furnaces. This heat is all lost. The only question that can now arise among engineers, is in respect to the quantity of water which may be evaporated in a given time; namely, whether the slow current of hot air in this furnace will evaporate as much water in the same time as in the quick current furnaces. Pamphlets have been published about this furnace, but we have not drawn any statement made above from any of them, and we will conclude our description by merely saying that experiments were made at Lowell by a Committee of the Lawrence Scientific School, and 9·179 lbs. of water were evaporated by Baker's furnace for each pound of coal, and only 6·317 pounds of water evaporated by one pound of coal without this furnace, and this was done in about equal times. This furnace is exceedingly applicable to the strongest and most simple of all boilers—the cylindrical one, but is also adapted for all kinds.—These furnaces are under the boilers for supplying steam to the engines in the Crystal Palace. Stillman, Allen & Co., of the Novelty Works, this city, are agents for the United States, and J. Amory, No. 28 State street, Boston, Mass., is the general agent.

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Scientific American.

NEW YORK, NOVEMBER 5, 1853.

New Theory of the Tides.

The present age is one of great progress in scientific discovery, but for all this there never was a time when more nonsensical theories were advanced, and more scientific persiflage infused into literature than at the present moment. There are many who, having merely a superficial acquaintance with natural phenomena, rush into the public prints with the most crude and foolish ideas, in explanation of things which require no explanation at all, because of their being well established facts, proved and known to all scientific men. Many men appear to regard every new theory as the true one; if it were so, we would have to look upon ourselves as living in a state of universal doubt and falsehood with respect to every question of science, for we have never known a single intricate question, yet, on which all men agreed. For example, a correspondent of the Washington "Union" thinks that all the almanacs, scientific and nautical books based on the theory of lunar oceanic influence, are constructed upon a mere *whim;* and gives the following as *his* theory of tides:

"The passage of the tides through the ocean is produced, in our opinion, by the filling up and emptying of certain corresponding cavities in the hidden surface of the globe. When these internal caverns are full of water, the tides are low on the surrounding shores of the earth. When they are empty, the water flows out into the oceans, and the tides rise. This plain proposition is susceptible, we apprehend, of complete demonstration."

He does not present any demonstration, however, excepting the following piece of balderdash:—"We trust Lieut. Maury will demonstrate, by all the lights of advancing civilization, why it is that the tides of the ocean rise and fall the most where the outer surface of the earth (and undoubtedly its inner surface also), is the most broken, where the volcanic fires have been the most violent. . . . . It is to be shown, we apprehend, that the waters of the American lakes do not rise and fall because of the even, confined, or close natures of the basins of earth which contain them. Whereas, if they were operated upon as some contend, by the moon, they ought to rise and fall at least as much as the Mediterranean, a sea no larger, no broader, no deeper than some of them."

We have also seen another theory advanced for the tides, namely, that of electrical influence—but it is equally as destitute of proof and demonstration as the above. A logician can detect at once an error in the above theory, viz., in attributing the tides to the emptying and filling of the cavities on the earth's surface—that being the very thing that requires explanation itself; this phenomena is not the cause—it is the effect of the tides.

The Mediterranean contains a great deal more water than all our lakes put together, and yet in the Bay of Naples, that place where volcanic fires have been most violent, and where, according to the above theory, tides should rise to an enormous height, they only rise about twelve inches, and except in the narrowest straits of the Mediterranean, they are not perceptible. What reader of history can forget the awe of Alexander the Great's Greek soldiers from the Mediterranean, when they first saw the waters of the Great Ocean in India ebb and flow like the breathing of a giant. In the Baltic and Black seas the tides are very small, while at Annapolis, in the Bay of Fundy, near the ocean, the tide rises to 100 feet. The tides can only be explained upon the principle of gravity—the attraction of the moon and sun. On our coasts the tides return later and later each day by 50½ minutes, according to the moon's position and her rate of sailing round our planet.

There is a perfect agreement between the moon's motion and that of the sea, for the tides though constant, are not always equal in one place, but are greatest when the moon is in conjunction, or opposition to the sun at the time of new and full moon, and least when in quadrature to it. This increase and diminution of the waters is regular, and constitute the spring and neap tides.

When we know that a sensible variation of the tides is produced by the relative position of the moon to various parts of our planet, and that with unfaltering regularity, we must condemn every man who advances another theory, as a shallow egotist, unless he produces proof of some other agency causing these effects, and showing the deception which the moon has so long practiced upon our senses.

Patent Office Report for 1852---No. 2.

In the last number of the "Scientific American," we briefly reviewed the Report of Commissioner Hodges, and will now devote some attention to that of H. B. Renwick, the engineering Examiner, who, since it was presented, has resigned, and is now one of the Inspectors in this city under the new Steamboat Law.—

Out of 493 applications examined at his desk, 165 were granted—about one fourth of the whole number. This was sharp work for this examiner's guillotine. A beautiful and eloquent tribute is paid to our American inventors. He points with pride to what they have achieved for the glory of our country, and the welfare, comfort, and happiness of our people.

The report, however, speaks rather hastily,—we believe that is the disposition of the man—about the want of any striking new invention during 1852, but the notices given of some particular inventions are proof positive that a number of very novel as well as useful improvements were made during that year. Of the locks patented that of F.C. Goffin, of this city, is very favorably noticed. Some very useful improvements in smelting furnaces are noticed, and that of C. G. Best, of Albany, which was illustrated in our last volume, was among the number patented. A new and excellent mode of making brass kettles, was patented. Formerly the discs of brass out of which such kettles were made, were placed in a lathe and formed by striking upon a die with a hammer. The new machine has a burnisher, which presses upon the disc of brass as it is revolved in the lathe, and forms the kettle with astonishing rapidity and precision on a cone.

A patent was granted for a new improvement in making nails by machinery. This consists in forming them partly by cutting and partly by pressing; the nails so made have the compound quality of the wrought and cut kind. A very important patent for propelling vessels was granted to a French gentleman. The wings of the propeller are arranged in three separate pairs, none of which are greater in width than the dead wood of the vessel. The first pair are secured on a hollow shaft, the second pair to another hollow shaft inside of the first, and a third pair to a solid shaft concentric to the first, and located within the second hollow shaft.—These wings are placed in a row a short distance from one another lengthwise of the ship. The various pairs can be made to alter their angular distance with respect to each other. When it is not required to use these propellers, they can by gearing, be folded up within one another like a shut fan, and made to lie in a line with the dead wood of the vessel, thereby offering but little resistance to its progress. As an auxiliary propeller, it appears to be a good improvement.

There were 27 patents granted for steam and gas engine inventions. Three steam boiler gauges are favorably spoken of, and a new valve motion receives great praise. A considerable space is devoted to the hot air engine of Ericsson, and as no patent was granted for it in 1852, it is noticed because it was a popular subject, and Mr. Renwick, the engineering Examiner was right, as it gives the public an opporunity of knowing his opinions and qualifications to judge of this subject. With his conclusions, however, we entirely disagree. The theory of this engine, he says, "is no uncertain one, *practical* difficulties are all that remain to be surmounted." Why did he not tell what those practical difficulties were. Since he considers the theory no uncertain one, it is evident he believes in perpetual motion, for that is the theory set up for it, and nothing less. A mistake is made about the pressure of hot air at 480° above the atmosphere, it is called 30 lbs. on the square inch; it amounts only to 14·35 lbs., and no more, according to Regnault, and no more than 15 lbs. according to Ericsson himself. Mr. Renwick should have known better than to speak of the hot air regenerator in the manner he does. This adjunct of the Ericsson has been a great stumbling block in the way of too many whose fame for engineering knowledge deceived us in respect to their judgment and practical acumen. They have looked upon the regenerator while absorbing the caloric of the exhausted hot air as if it were the purse of Fortunatus, forgetting that the heat of steam could be saved in the same manner, but at the expense of garroting the power. This is the reason why the hot air ship moved so slow during its short life; it saved its heat and died of a cold. This Report calls the Ericsson a proved theory, not an uncertain one. We say so too, it has been proved and found wanting. We will briefly review the Report of Examiner Gale in our next number.

Plan for Building the Pacific Railroad.

There are two subjects which will doubtless occupy a prominent position in the legislation of Congress at its next session,—the Pacific Railroad and the disposal of the surplus funds now in the Treasury. The former of these has been long before the people, and the discovery of gold in California, which has drawn adventurers thither from almost every town, village, and hamlet in our land, has made it a matter of personal interest to hundreds of thousands who have now a relative or friend in that far off portion of our Republic. This fact, joined with the knowledge that the commerce of the Orient is a productive mine, that the nation possessing it is commercially and often politically mistress of the world; that the Pacific Railroad, when built, will form the shortest, and for many of these commodities, the cheapest route of transportation—has rendered it a matter of necessity that the road be speedily built. The question now arises, how can this best be done?

A well-known individual proposed, a few years ago, to build this road and cede it to the government, provided the government, in return, would cede him a strip of land sixty miles in width, adjacent to the road. This was received with little favor by the public, on the ground of its being, as it certainly was, a gigantic land speculation. It has also been proposed to build the road by individual enterprise, but this has never been done, partly from the difficulty of procuring the necessary amount of subscription, and partly from the fear of its becoming a powerful monopoly—so powerful, indeed, as to endanger the purity of our republican institutions. A company for this purpose is now organized in this city, and although the requisite amount of stock has been subscribed upon their books, yet the public are strongly inclined to believe that much of this is fictitious, from the conviction that certain of the heaviest stockholders have subscribed largely above their capital; and these facts, together with the present and prospective pressure in the money market render it highly improbable that this company will be able to carry out their designs.

It has also been proposed that the road should be built and controlled entirely by government, but the well-known fact that any public work, executed by the government, costs far more than when executed by private enterprise, together with the corruption which too frequently attends any extensive contracts of this kind, has prevented, and will doubtless prevent this from being done. Were it not for these considerations, it is very likely the public would demand that the surplus funds now in the Treasury should be expended in this work; and it is highly probable that the company already referred to will solicit from Congress a gift of a large portion of these funds to enable them to build the road; nay, it is almost certain that a proposition of this kind has already been considered. But we think the public will be opposed to this, as the time will come when this money will be needed to liquidate the debts now outstanding against the Treasury, and we shall now endeavor to present the outlines of a plan which will be free from all the objections we have considered, and against which we think no other objections of equal weight can be urged.

A company to be called the "Mississippi and Pacific Railroad Company," shall be organized, by the appointment, by the President of the United States, of three individuals, who, with three others, to be selected by the friends of this scheme, and a seventh, to be chosen by a majority of those already named, shall constitute the Board of Directors of the company, having the powers usually appertaining to such officers.

The Board of Directors shall, as soon as possible after their appointment, complete their organization and cause any surveys to be made which may be necessary, in addition to those authorised by the Government, from which they shall select the route judged by them most suitable, and shall cause the work upon such route to be immediately commenced.

A Board of Auditors shall be appointed by government, who shall once in each month examine the accounts of the company, and all cash obligations actually incurred by them in the construction of the road, shall be paid from the public treasury, and charged to the company.

All persons employed by the company at the rate of not more than one dollar per day shall be paid two-thirds in money; all persons receiving more than one dollar per day shall be paid one half in money; the remainder shall be paid by an order on the government for a land warrant, which shall be granted at the present price, but not in any other quantity than in equal multiples of twenty acres.

As often as any person shall have received from the Company in money and lands, a sum equal to one hundred dollars, he shall receive a certificate which shall entitle him to one share in the capital stock of the company, which certificate, and also the land warrants, shall not be transferable, except to employees of the company, until a cash dividend shall have been declared upon the capital stock; nor shall any person, until that time, be entitled to hold more than ten times the amount of land warrants, or of stock, which he shall have received for his own services. The persons holding these certificates shall be the sole stockholders of the company, and shall, in any meeting for the election of officers, be allowed one vote for every share held by them. In one year from the time when the Board shall have completed its organization, and annually thereafter, such elections shall be held at the principal office of the Company.

At the completion of the road, a mortgage shall be taken by government upon the road and the rolling stock thereof, for the full amount loaned the company, which mortgage shall bear interest at the rate of six per cent. per annnm, until it shall be paid, and all the proceeds of the road, above what is needed for necessary expenses and repairs, shall be appropriated to the liquidation of this debt.

This, as we have already said, is but an outline of the plan, presenting only its leading and essential features. Should it be received with favor by the press, and the public generally, we will, before the meeting of Congress, draw up a complete statement of it, embracing several details necessary to prevent all attempts at speculation or corruption, and present it in the form of a memorial to that body. We invite the attention of the press to this subject.

War.

War has at last been declared and determined upon between Turkey and Russia. The Czar has declared that it will be one of extermination. It is not known whether England or France will take an active part or not.

PRIZES!! PRIZES!!

The following Splendid Prizes will be given for the largest list of mail subscribers to the Scientific American, sent in by the first of January next:

$100 for the largest list.		$30 for the 7th largest list.	
$75 for the 2d largest list.		$25 for the 8th	ditto
$50 for the 3d	ditto	$20 for the 9th	ditto
$45 for the 4th	ditto	$15 for the 10th	ditto
$40 for the 5th	ditto	$10 for the 11th	ditto
$35 for the 6th	ditto	$5 for the 12th	ditto

The cash will be paid to the order of the successful competitors immediately after January 1st, 1854.

These prizes are worthy of an honorable and energetic competition, and we hope our readers will not let an opportunity so favorable pass without attention.

☞ For Terms see Prospectus on the last page.

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We shall give our readers, this week, another of our *omnium gatherum* articles for the purpose of noticing those articles in the Machine Arcade, not properly included in any of the classes we have been considering, and we shall then pass from the Arcade to other parts of the building.

Flax Machinery—We know of no machine in the Exhibition which is destined, in our opinion, to affect as great a change in the industrial interests of our country, as the flax and hemp machinery of Lewis S. Chichester, of Brooklyn, N. Y. It is to the North what Whitney's cotton gin was to the South. When it is remembered that the growth of flax for the seed alone is found very profitable at the West, and that thousands of tons of flax straw are there annually burned as worthless, simply because the cost of dressing it by hand is greater than the price after it is broken, we shall readily perceive that any machinery which shall render this straw so valuable, as of itself to more than pay the cost of cultivation, must of necessity create at the North an interest which will prove a powerful rival to the cotton interests of the South.

We think Chichester's machines will do this, provided other favorable circumstances concur. There must certainly be a demand created for the staple, and this can only be created by the general introduction of machinery for spinning it. But we must pass to the consideration of the machines themselves.

We will here mention that Chichester has invented a machine for pulling the flax, although it is not in the Exhibition. It is propelled by a single horse, and lays the flax in bundles ready for binding. The first of the machines in the Exhibition is the "Flax and Hemp Brake." This is furnished with a feed-table, from which the material is entered into a pair of rollers which flatten the stalks, and it is then passed through a pair of fluted rollers which deliver it to the breaking cylinders. These are formed by securing near the opposite end of a shaft, a pair of iron heads perforated with radial slots, into which are inserted breaking plates, which are free to move towards or from the center of the cylinder heads, as they are guided by cams and springs, arranged in such a way that the ends of every other plate in each cylinder project through the radial slots in the cylinder heads, and rest upon stationary cams placed outside of the heads, and all the intermediate plates rest upon spiral springs supported by circular flanges, keyed on the shafts just inside the cylinder heads. As the cylinders revolve together (one being placed over the other), the cam-plates or ribs of the lower cylinder are guided upwards, and meet and carry back the spring or pressure plates of the upper cylinder; at the same time the cam-plates or ribs of the upper cylinder are in the same manner guided downwards, and meet and carry back the pressure plates of the lower cylinder.

This machine is illustrated and described in No. 44, Vol. 7, "Scientific American." From its slow movements but little power is required to propel it, and it is rendered a very durable and efficient machine.

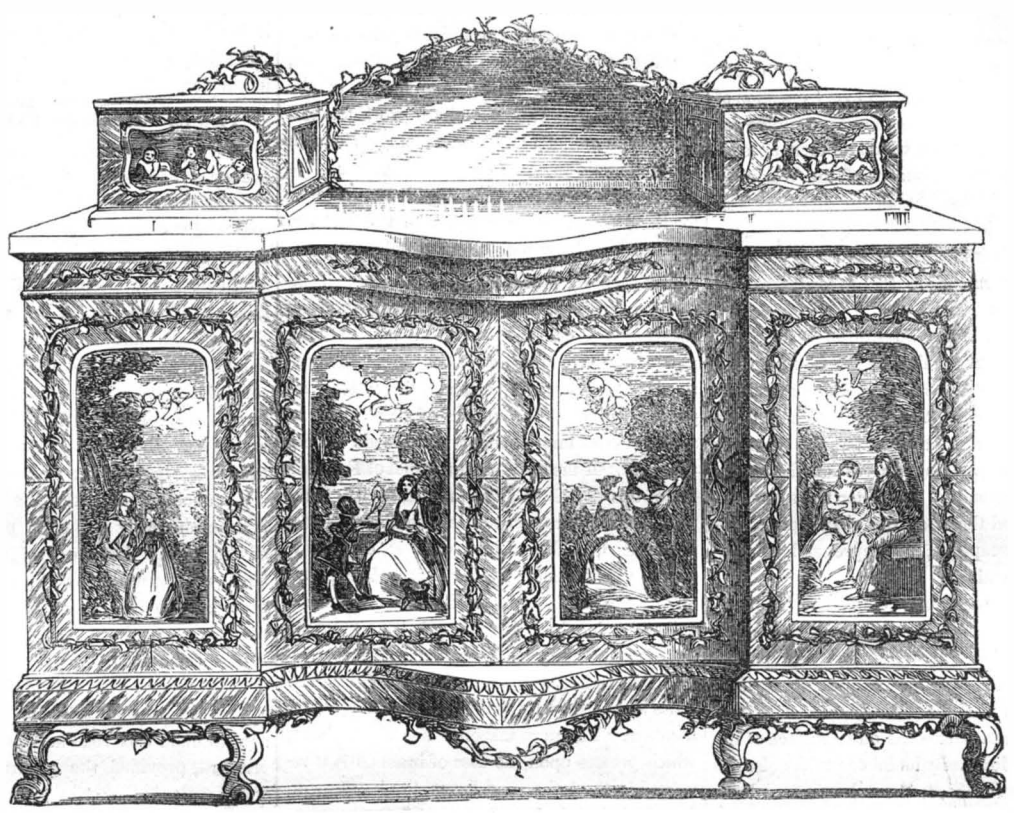
The "Dresser" consists of two conical cylinders, formed on parallel shafts, driven by a pair of gear-wheels fastened outside of the frame. These cylinders are each formed of four spiral blades of wood, secured to flanges of iron, which are keyed on to opposite ends of the shafts, and placed one over the other, revolving towards each other, the blades of one cone being opposite the spaces between the blades of the other. A slot is cut through the front casing, along the bite of the cones through which the operator first introduces the flax to the action of the dressing blades. These blades draw in the mass, striking first on one side and then on the other, nearly at right angles with the line of the fiber, beating out the wood and impurities which pass off through the opening behind. The mass is then moved along the slot towards the other end of the blades, to be finished. The conical and spiral form of the blades cause a gradual change in the direction of the blows from the feed end, where the blows fall at right angles to the mass, towards the finishing end of the cones, where the direction of the blows is nearly lengthwise with the line of the fiber. At the feed end, the blades are left very blunt and rounded off. This, also, changes gradually to a sharp edge at the finishing end. The severity of the blows is also increased as the radius of action increases, towards the larger end of the cones. With this arrangement, also, a larger space is left at the feed end for the mass when filled with shives, which gradually diminishes as the mass is cleaned and diminished in bulk.

It will be remembered that these machines are intended for the use of a neighborhood, hence, although costly, as one set of machines can readily dress the flax of a number of farms, this need not prevent their introduction; we think, however, the manufacturers would find it a matter of interest to themselves to reduce the price.

We understand that there are in the country other machines for dressing flax, but as they have not been brought into public notice, we cannot speak of them from our own knowledge.

Theodore S. Minniss, of Meadville, Pa., is the inventor and exhibitor of a patent lubricating box, for the journals and shafts of machinery, which is really a very good invention, when applied to heavy shafting. The one intended for vertical shafting is that in which we have most confidence, and this we will proceed to describe. The foot of the shaft is expanded into a hollow cylinder of sufficient capacity to contain a weight of water equal to the entire weight of the shaft and all resting upon it; this hollow cylinder is water-tight, and being filled with air it is evident that when plunged in a vessel of water it will support the shaft, and at the same time will be in contact with the water only. Its motion is however made steady by a pivot in the center and by the water vessel the size of which is reduced to but a trifle more than the diameter of the sustaining cylinder. Mechanical engineers will do well to notice.

ELEGANT CARVED CABINET.



Brick Machines.—There are on exhibition a number of models of brick machines. One by F. H. Smith, of Baltimore, Md., illustrated on page 409, Vol. 7, "Scientific American;" this is, no doubt, an excellent machine. N. Adams, of Canterbury, N. Y., also exhibits one of his well known machines—an engraving of which appeared on page 156, Vol. 4, "Scientific Am." A. H. Sampson, of New Orleans, exhibits another model; we also saw another by Sands and Cummings, of Cambridge, Massachusetts. We are told that one of their machines will mould 1,500 bricks per hour, and that by means of them ordinary laborers can without difficulty produce brick of a good quality.—They can be worked by horse or steam power, the workmen having only to shovel in the untempered material, and carry away the moulded brick.

Perry Dickson, of Blooming Valley, Crawford Co., Pa., exhibits a model of a sled lock to prevent the sled or sleigh from crowding against the horses in going down hill, which is very ingenious. It is formed by attaching a couple of bars turned downward at the end, firmly to the roller, and connecting the tongue to them at their front ends by a hinge joint, so that when the sled crowds forward the back end of the tongue will fly up, throwing the dogs downward into the ground. An engraving of this invention may be found on page 404 Vol. 7.

Patrick Clark, Rahway, N. J., has a model of an arrangement which he calls a "Static Regulator for Steam Boiler Fires." It is intended to equalize the heat of the fire and thus produce a steady pressure of steam. This is accomplished by causing an undue pressure of steam to operate a damper and thus lessen the draft, and consequently the amount of combustion. We should think it a very good arrangement. It received a gold medal at the Fair of the American Institute.

Apple Parer—In the Agricultural Department is a beautiful plated model of Smith & Fenwick's Apple Paring, Quartering and Coring Machine, patented this year, and illustrated on page 184, Vol. 8, "Scientific American." We think this is the best apple machine, considering the number of offices it performs, that has ever come to our knowledge, and we observe it attracts much attention at the Exhibition. The paring taken from an apple by this machine is as thin as a wafer, and the quartering and coring is accomplished in the most complete manner. One of the inventors told us that between two and three bushels of apples could be pared, quartered, and cored easily in an hour with one machine, and from its construction we have no doubt he told the truth. The patentees may be found at 14 Vandam street, this city.

Window Shutter Fastener.—In the same case with Smith & Fenwick's machine, is a fine model of the new Hinge Fastener, for shutters, patented by Samuel Barker in 1852. This invention is very ingenious, it consisting simply in casting a solid square on the top of the round nipple of the hinge, and having a square cap to fit over the same; its object is to hold open window shutters, and thereby dispense with the use of fastenings. The cap can be put on and taken off from the inside, which is an important thing in stormy weather, as it removes the necessity of thrusting the head and arms out of the window. This invention is worthy the notice of hinge manufacturers and builders. See engraving on page 292, Vol. 7, "Scientific American," and for further particulars address R. W. Fenwick, 200 Allen street, New York City.

There is at the north end of the Arcade, one of Hurd's patent centrifugal sugar machines, illustrated in No, 5, Vol. 7, "Scientific American." G. B. Hartson, & Co., Globe Iron Works, New York, are the agents and sole manufacturers. We are told that these machines are very durable and efficient.

Near the above is a grist mill with the stones dressed according to Holden's shear cut draft. We should think this an excellent draft for dressing the stones of a flouring mill, the theory at least is good, and the work so far as we could judge under the circumstances, was very well done. This mill is propelled by a rotary engine, the invention of Abram Pease, Lyons, N. Y., for which a patent was granted Feb. 12, 1844. From what we could learn of this engine, we are disposed to think very favorably of it, but we shall be better prepared to judge after having an opportunity to see the interior arrangement.

Our illustration this week is an engraving of a carved Cabinet, with views of Woman's History, it is from the manufactory of H. & A. Arrowsmith, London.

The Directors of the Crystal Palace have finally altered their previous intentions, and have announced that instead of being closed in Dec. it will be kept open through the winter.

Letter from a Subscriber.

The annexed extracts from one of the letters received by us, is but a specimen we are receiving constantly from all parts of the country:

"Enclosed you will find a list of subscribers for your very valuable paper; I will probably be able to send another soon. Olive Foundry, of this place, furnishes 25 subscribers out of 48 mechanics. The whole list, I claim, is quite respectable for a town that had no existence four years ago. Ironton is pleasantly located on the banks of the Ohio river. Its present population is 3,000. There is in operation and in course of erection, 3 rolling mills, 1 stone and hollow ware foundry, one large foundry and machine shop, 2 sash, and door factories, an axe factory, fire brick establishment, merchant grist mill, saw mill, steam boiler, and car manufactory, together with the usual number of less pretending shops. This is strictly a temperance town, the original owners of the lots inserting a provision that they shall never be used for the sale of intoxicating drinks. Mechanics are much needed here, wages being from $9 to $12 per week." Following this is a list of 67 subscribers. The writer has our thanks for these, and we have the vanity to think he will receive the thanks of those subscribers to whom he has introduced us.

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TO CORRESPONDENTS.

C. D., of ——.—Send us a model and description of your invention. We presume it is a good thing. Be careful and make it of the proper size.

E. C. B., of N. Y.—A patent granted to James Cox, 1846, covers such a ladder as you describe. Therefore you cannot obtain a patent for it.

F. J. H., of Pa.—If a railroad is established in Broadway, it must have a double track, and the cars will be drawn at a moderate rate of speed by a span of horses. No steam machinery would ever be allowed in such a thoroughfare.

B. S. W., of R. I.—You cannot obtain the Reports mentioned in your letter. The patent list has been published regularly in the Scientific American since its commencement.

J. E. D., of Ill.—A patent could not be obtained for your changes in "Musical Notation." You can copyright books embracing the improvements.

A. F., of Mass.—We do not know who can furnish you with an electro magnetic engine of two horse power.

J. R. E. S., of Pa.—On page 59, Vol. 7, Scientific American, you will find a method of galvanizing iron, Sorel's patent, which is much in use.

G. R., of N. Y.—The only way by which protection can be afforded to you under the circumstances, is by an especial act of Congress.

S. E. M., of La.—We have not yet had time to publish the book to which you refer. Your letter of August 29th we do not find among our file.

N. Y., of Ohio.—Your favor is received enclosing $10 for additional subscriptions. We are pleased with your favorable opinion of us.

A. McQ., of Geo.—The apparatus to which you refer, is not like a steam boiler, it could be fed with a cask not over one foot above the boiler: but the passage to which you refer does not mention the head, merely the height, where the vessel should be placed above the boiler.

J. U. S., of Ohio—The new mode of applying the power of the trains, such as the connections with the rails, or whatever it may be, would be patentable.

D. K., of Ill.—Mix your hydraulic cement and use it like mortar; let the bricks be moist when it is put on.—Put on three coats on your cistern, the first thin, then go over it twice, until the whole is about three-fourths of an inch in thickness. The outside of your cistern should be well puddled with clay.

D. A. H., of Pa.—We do not know of an apparatus for feeding mill stones like the one described in your letter, and should think it patentable.

M. M. D., of Va.—Up to this time your models had not arrived. Have notified Adams & Co.

H. M. B., of N. Y.—We are of the opinion that Swingle's Mortising Machine, which operates as you describe, is sold by S. C. Hills, No. 12 Platt street, this city. Portable engines are best for your purpose.

E. E., of Va.—You will find by reference to our advertising columns the address of the manufacturer of such machines as you require. We are always glad to give our readers any information in our power, but there is no reason for troubling us with enquiries which are clearly enough answered in the paper, occasions of this kind are very frequent, and we think we have a right to complain of their repetition.

W. R., of Ala.—We cannot discover any advantages in your excavator not embraced in inventions now in use for the purpose. It embraces no patentable features.

W. F., of Ala.—We see no novelty in your double cylinder force pump. It contains no features not found in other pumps operating on the double action and force principle.

M. K., of N. Y.—There is no vacancy in our office to be filled at present.

J. L., of Md.—We do not know of any concern in this city engaged in the manufacture of small oscillating enes, excepting G. B. Hartson & Co., Globe Iron Works.

E. C. J., of Mass.—Watson's electric lamp is an English invention; it gives a beautiful light, but we cannot tell what its price is, nor where you can buy one. If you take some oxalic acid, dissolve it in warm water, and dip your iron-stained linen in it, the stain will disappear. This acid is a poison—the linen must afterwards be rinsed in water.

G. M., Jr., of Ill.—You propose to drive your wheel by the draft of air to feed your furnaces. The pressure on the square inch will be just in proportion to the quantity and velocity of the air. Your combustion would be lessened according to the power derived from your wheel, and you would obtain no benefit by the arrangement whatever.

C. Van V., of N. Y.—We will attend to your request next week.

J. C., of Va.—It is not true that electricity moves on the surface only, consequently your plan would be of no avail.

G. W. R. B., of La.—We would procure the book for you with pleasure if we could find it, but that we have not been able to do.

X. Y., of Ct.—The best way to obtain a knowledge of "Mechanical Engineering," is to go into a machine shop and learn the trade. It will be well for you to season your practical knowledge with all the theoretical. that you may have time to devote to study.

F. F., of Mo.—We have seen no head cutter at the Crystal Palace which we think embodies your invention.

H, M., of Ohio—No jointed paddles on a wheel will answer: they cannot be made strong enough.

H. S., of Ky.—What you propose has been done long ago, namely, covering telegraph wires with glass tubes, but that did not prevent the current being affected by atmospheric influences; all our wires are covered with a good non-conducting substance; the surface theory is not sufficiently proved.

Money received on account of Patent Office business for the week ending Saturday, Oct. 29:—

J. H., Jr., of Wis., $30; G. R., Jr., of Pa., 25; E. D., of Vt., $30; C. R., of Ill., $35; J. F., of Ky., $35; G. M. R., of N. Y., $10; W. C. W., of Mass., $10; C. E. O., of N. Y., $20; E H. P., of Ct., $12; P. K., of N. J., $30; A. A., of C. W., $40; T. W. K., of N. Y., $30; A. C. C., of N. Y., $30; J. W., of C. W., $30; W. C., of Ga., $26; J. P., of Ky., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Oct. 29:—

J. H., Jr., of Wis.; J. W., of C. W.; R. & H., of Pa.; J. L. G., of Ga.; I. H., of N. J.; T. W. K., of N. Y.; E. H. P., of Ct.; A. C. G., of N. Y.; C. & C., of R. J.; W. C., of Ga.; S. E. P., of Pa.

A Chapter of Suggestions, &c.

BACK NUMBERS—VOL. 9.—The first three numbers, Vol. 9, being so nearly exhausted, we are led to announce that in future we shall not furnish the back numbers to any but those who pay for a full volume in advance. Half yearly subscribers cannot be furnished with the first numbers of the volume, unless the applicant is pecuniarily unable to remit the full amount, in which event his case will be exempt from this rule, by his making such statement in the letter which accompany's the remittance.

MISSING NUMBERS—Mail Subscribers who have failed to receive some of the numbers of Vol. 8, are informed that we are able to supply them with any of the numbers, from 1 to 52, EXCEPT the following, and these we are ENTIRELY out of—Nos. 2, 3, 4. 10, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 26, 47, 48, 49, 50, 52.

TO CORRESPONDENTS.—Condense your ideas into as brief space as possible, and write them out legibly, always remembering to add your name to the communication: anonymous letters receive no attention at this office. If you have questions to ask, do it in as few words as possible, and if you have some invention to describe, come right to the business at the commencement of your letter, and not fill up the best part of your sheet in making apologies for having the presumption to address us. We are always willing to impart information if we have the kind solicited.

PATENT LAWS AND GUIDE TO INVENTORS—We publish and have for sale, the Patent Laws of the United States—the pamphlet contains not only the laws but all information touching the rules and regulations of the Patent office. Price 12 1-2 cents per copy.

BINDING.—We would suggest to those who desire to have their volumes bound, that they had better send their numbers to this office, and have them executed in a uniform style with their previous volumes. Price of binding 75 cents.

RECEIPTS—When money is paid at the office for subscriptions, a receipt for it will always be given, but when subscribers remit their money by mail, they may consider the arrival of the first paper a bonafide acknowledgment of the receipt of their funds.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement: Of Vols. 1, 2, 3, and 4—none. Of Vol. 5, all but six numbers, price, in sheets, $1; bound, $1,75. Of Vol. 6, all; price in sheets, $2; bound, $2,75. Of Vol. 7, all; price, in sheets, $2; bound, $2,75. Of Vol. 8, all; price, in sheets, $2; bound, $2,75.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given and often with the name of the post-office also omitted Persons should be careful to write their names plainly when they address publishers, and to name the post. office at which they wish to receive their paper, and the State in which the post-office is located.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

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☞All advertisements must be paid for before inserting.

American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express, or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

EUROPEAN PATENTS.—MESSRS. MUNN & CO. pay especial attention to the procuring of Patents in foreign countries, and are prepared to secure patents in all nations where Patent Laws exist. We have our own special agents in the chief European cities; this enables us to communicate directly with Patent Departments, and to save much time and expense to applicants.

POLYTECHNIC COLLEGE—Of the State of Pennsylvania, south-west corner of Market st, and west Penn Square, Philadelphia. This College, incorporated by the Legislature, April, 1853, is designed to afford a thorough professional education to students intended for Engineering, Mining, Agriculture, and the Mechanical and Chemical Arts. The Trustees announce that the Lectures on Chemistry and its application to the Arts, will be commenced in the Lecture Room of the College, by Prof. Alfred L. Kennedy, M. D., on Tuesday, Nov: 1st, at 12 o'clock, M., and be continued on Mondays, Tuesdays, Thursdays, and Fridays, throughout the Session. The Analytical Laboratory is also open for students in Practical Chemistry. MATTHEW NEWKUK,
President Board of Trustees.
JOHN MCINTYRE, Sec'y. 8 2

MACHINERY.—S. C. HILLS, No. 12 Platt-st., N. Y. dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's, and Law's Planing Machines; Dick's Presses, Punches, and Shears; Morticing and Tennoning Machines; Belting; Machinery Oil, Beal's Patent Cob and Corn Mills; Burr Mill and Grindstones; Lead and Iron Pipe, &c. Letters, to be noticed, must be post-paid. 1tf eow

SOAP STONE—An extensive strata of fine Soap Stone, or what is more commonly known as French chalk, is for sale, cheap. Address WM. HENRY, Wyoming, P. O., Luzerne Co., Pa. 8 4*

HENRY TANNER vs. HUDSON RIVER R.R.Co. } Circuit Court of the United States for the Northern District of New York.

This was a suit brought by the plaintiff for an alleged infringement of Letters Patent granted to him, as assignee of the inventors (L. F. Thompson and A. G. Bachelder), for an improved Railroad Brake, by the use on the said Road of brakes made on plans alleged to have been invented by Nehemiah Hodge, and also by F. A. Stephens, and purchased by the said defendants from the said Hodge and Stephens, and also for use of the plan as patented to said Tanner. The suit was noticed for trial at the October Term of 1853, and put over the term by the motion of defendants' counsel, by paying the costs of the term. And thereafter the defendants' counsel made overtures for a settlement, which resulted in the defendants acknowledging the validity of plaintiff's patent, the infringement of the said patent by the use of double-acting brakes on the plan of the said patent, and the Company paying to the said plaintiff, for the right to use the said invention and for the withdrawal of said suit, the sum of $1000 and costs.

Having read the above, I do certify to the correctness of the statements therein contained. THOS. M. NORTH,
Sec'y and Attorney Hudson River R. R. Co.
Oct. 35, 1853.

NEW YORK, Oct., 26th, 1853.—This is to certify that I was of counsel for the plaintiff in the above entitled cause. That the suit was brought for the recovery of damages from the Hudson River Railroad Co., for the use on their cars of brakes made on the plans described in the patent granted to Charles B. Turner on the 14th of November, 1848, to Nehemiah Hodge, on the 2nd of October, 1849, and to F. A. Stephens on the 25th of November, 1851. That in preparing for the trial of the above entitled cause, I made a careful examination of all the facts given in the notice of defence, and became satisfied that Thompson and Bachelder, from whom Tanner derived title, were the original and first inventors of the double acting brake covered by the plaintiff's patent, and that the brakes of Turner, of Hodge, and of Stephens are infringements of the said Tanner's patent.

CHAS. M. KELLER.

ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic, Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc., etc.
CHARLES W. COPELAND,
7 13* Consulting Engineer, 64 Broadway.

HUDSON MACHINE WORKS and Iron Foundry—at Hudson City, N. Y., are prepared to contract for castings for railroads, bridges, buildings, gas pipes and posts, water pipe, cast-iron ornamental floors, cannon, &c. Steam engines and boilers, high and low pressure, sugar mills, Cornish lifting and forcing pumps for mines, also superior hydraulic pumps and presses, and superior machinists' tools made to order. Especial attention given to the making of patent machines. Orders by mail will receive prompt attention,
LANG, COOK & CO.
T. H. LANG, (late foreman at the New York Novelty Works), F. COOK, H. McCLELLAND. 7 3m

BLACK LEAD CRUCIBLES—Of superior quality, warranted equal to any manufactured in the World, by D. H. PURINTON, of Somerset, Mass. 7 5*

A CHANCE TO MAKE MONEY—Agents will find profitable employment in selling a valuable invention, by calling on Geo. O'DONNELL, 305 Pearl st., N. Y. 7 3*

AMERICAN ENGINEERS ASSISTANT.—Lately published.—The American Engineer, Draftsman and Machinist's Assistant, designed for Practical Workingmen, Apprentices, and those intended for the Engineering profession, illustrated with 200 wood cuts, and 14 large engraved Lithographic Plates, of recently constructed American Machinery and Engine Work; by Oliver Byrne. Embracing—Mathematical and Drawing Instruments, Geometrical Problems, Brackets and Pillow Blocks, Lubricators, and Electric Steam Gauge, Horse Power, Parallel motions, The Indicator, Safety Valves, High Pressure Engines, Steamship Engines and Boilers, Rotary Engine, Locomotives, Screw Propellers, Ericsson's Caloric Engine, &c., &c. The work is published in one large 4to vol., handsomely bound, and sold at the low price of $5. It will be sent to any part of the United States free of Postage, on receipt of the amount by mail. A liberal discount made to Agents and Booksellers. Address, C. A. BROWN & CO. Publishers, N. W. Cor. of 4th and Arch streets, Philadelphia. 6 6

UNITED STATES PATENT OFFICE,
Washington, Sept. 28, 1853.

ON THE PETITION of Herrick Aiken, of Frankliu, New Hampshire, praying for the extension of a patent granted to him on the twenty-seventh day of Dec., 1839, for an improvement in constructing sockets for holding tools, for seven years from the expiration of said patent, which takes place on the twenty-seventh day of December, eighteen hundred and fifty-three—

It is ordered that the said petition be heard at the Patent Office on Monday, the 19th of December next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvania, Philadelphia, Pennsylvania; Evening Post, and Scientific American, New York; Boston Post, Boston, Massachusetts, and Patriot, Concord, New Hampshire; Enquirer, Cincinnati, Ohio, once a week for three successive weeks previous to the second Monday of January next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 6 3

WATTS, BELCHER & CO.—Machinists, Manufacturers of Steam Engines, Lathes, Planing Machines, and Machinists' Tools of all descriptions. Jobbing promptly attended to. Passaic Works, Passaic st. Newark, N. J. WM. WATTS, ZACHARIAH BELCHER, & GEO. WATTS. 6 4*

MECHANICAL DRAWINGS—J. H. BAILEY, Mechanical or Architectural Drawings executed in all kinds of perspective. Office Tryon Row, No. 5, opposite the City Hall. 5 4*

COCHRAN'S QUARTZ CRUSHER—These machines having proved by practical operation at various gold mines their superiority over all others, for pulverising Quartz Rock, are recommended with confidence to parties in want of such machinery. A machine can be seen in daily operation in this city, on application to JOHN S. BUSSING & CO.,
4 8t 32 Cliff street, N. Y.

EUREKA GOLD SEPARATOR—This machine has been thoroughly tested by scientific and practical gold miners, and pronounced far superior to any Amalgamator yet known—an Alalgamator taking up but three feet square, and very trifling power, is capable of amalgamating one ton per hour, with great ease and perfection, without any loss of quicksilver whatever. They are portable, and delivered in boxes ready for shipment. Price $300 each. Further information can be obtained on application to JOHN S. BUSSING & CO.,
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NEWELL'S PATENT SAFETY LAMP AND Lamp Feeder—A new article warranted to prevent all accidents from the use of Burning Fluid, Camphene and other explosive compounds, used for the production of light. For sale, wholesale and retail, by NEWELL, CALDWELL, & COFFIN, 28 Broomfield street, Boston, and by G. W. McCREADY,
4 5t* 426 Broadway, N. Y

THE NEW HAVEN MANUFACTURING CO.—New Haven, Conn., having purchased the entire right of E. Harrison's Flour and Grain Mill, for the United States and Territories, for the term of five years, are now prepared to furnish said mills at short notice. These mills are unequalled by any other mill in use, and will grind from 20 to 30 bushels per hour of fine meal, and will run 24 hours per day, without heating, as the mills are self-cooling. They weigh from 1400 to 1500 lbs., of the best French burr stone, 30 inches in diameter; snugly packed in a cast-iron frame, price of mlll $200, packing $5. Terms cash. Further particulars can be had by addressing as above, post paid, or to S. C. HILLS, agent N. H. M. Co., 12 Platt st., N. Y. 5 tf

NEW HAVEN MANUFACTURING COMPANY—Tool Builders, New Haven, Conn., (successors to Scranton & Parshley) have now on hand $25,000 worth of Machinists' Tools, consisting of power planers, to plane from 5 to 12 feet; slide lathes from 6 to 18 feet long; 3 size hand lathes, with or without shears; counter shafts to fit all sizes and kinds of universal chuck gear cutting engines; drill presses, index plates, bolt cutters, and 3 size slide rests. The Company are also manufacturing steam engines. All of the above tools are of the best quality, and are for sale at 25 per cent. less than any other tools in the market. Cuts and list of prices can be had by addressing as above, post-paid. Warehouse No. 1 Platt st., New York, S. C. HILLS, Agent N. H. Manufacturing Co. 5tf

PLANING, TONGUING, AND GROOVING—BEARDSLEE'S PATENT.—Practical operation of these Machines throughout every portion of the United States, in working all kinds of wood, has proved them to be superior to any and all others. The work they produce cannot be equalled by the hand plane. They work from 100 to 200 feet, lineal measure, per minute. One machine has planed over twenty millions of feet during the last two years, another more than twelve millions of feet Spruce flooring in ten months.. Working models can be seen at the Crystal Palace, where further information can be obtained, or of the patentee at Albany, N. Y
1 tf GEO. W. BEARDSLEE.

PARSONS' SELF-STRAINING SAW—Requires only ten pounds' weight to strain it, and combines the advantages of both muley and gate or sash mills, will bear as much feed, is as easily kept in order, will cut as much lumber with one-fourth less power, and is in successful use in five States. A working model is in the Crystal Palace, where further information can be had, or of the proprietor at Wilkesbarre, Penn., JAMES JONES. S. E. PARSONS, Agent.

PATENTS OF INVENTION—ISAAC B. FUTVOYE, Patent Agent, Quebec, undertakes to procure letters patent of invention for the Province of Canada. I. B. F. will dispose of any kind of Patented Articles on Commission. 4 tf

A. B. ELY, Counsellor at Law, 52 Washington street, Boston, will give particular attention to Patent Cases. Refers to Messrs Munn & Co., Scientific American. 16tf

LEONARD'S MACHINERY DEPOT, 109, Pearl st., and 60 Beeaver, N. Y.—Leather Banding Manufactory, N. Y.—Machinist's Tools, a large assortment from the "Lowell Machine Shop," and other celebrated makers. Also, a general supply of mechanics' and manufacturers' articles, and a superior quality of oak-tanned Leather Belting. P. A. LEONARD.
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LOGAN, VAIL & CO., No. 9 Gold st., New York.—Agency for Geo. Vail & Co., Speedwell Iron Works, Morristown, N. J., furnish and keep on hand Portable Steam Engines of various sizes, Saw and Grist Mill Irons, Hotchkiss's Water Wheels, Iron Water Wheels of any size, Portable Saw Mills, complete; Bogardus's celebrated Planetary Horse Powers; heaving forgings and castings for steamboats and rolling mills, Ratchet Drills of superior quality for machinists, Saw Gummers, Hand Drills, Tyre Benders, and shafting and machinery generally.
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NORCROSS ROTARY PLANING MACHINE,—Decided by the Circuit Court not to infringe the Woodworth Machine—I now offer my Planing Machines at a low price; they are not surpassed by any machines as to amount or quality of work. Tongueing and grooving machines also for sale, doing one or both edges as desired; 80 machines now in operation. Address me at Lowell, Mass., N. G. NORCROSS.
40 20*

MCALLISTER & BROTHER.—Opticians and dealers in mathematical instruments, 48 Chesnut st., Philadelphia, Pa. Mathematical instruments separate and in cases, Protractors, Spacing Dividers, Drawing Pens, Ivory Scales, Tape Measures, Salometers, Spy Glasses, Microscopes, Hydrometers, &c., &c. An illustrated and priced catalogue will be sent by mail free of charge. 40 6m*

VALUABLE WATER POWER FOR SALE—Situated in Stockport, Columbia Co., N.Y., 1 1-4 miles from a depot on the Hudson River Railroad, on a never-failing stream, now estimated to be of the capacity to run 600 power looms with all necessary machinery, and may be increased; dam built of stone, 19 feet fall. The improvements on one side consists in part of a building of stone and brick 118x47; over-shot wheel, nearly new, 14 feet diameter, 12 feet bucket; on the other, one of stone and wood 60x34, good over-shot wheel 14 feet diam. 7 feet bucket; with about 30 dwellings. Terms accommodating; title indisputable. Possession given immediately. For particulars inquire of R. B. MONELL, of Hudson, N. Y., or H. S. VAN DeCARR on the promises. 3 6*

PALMER'S PATENT LEG.—Manufactured by Palmer & Co., at No. 5 Burt's Block, Springfield, Mass., for New England and New York States, and 376 Chesnut street, Philadelphia; in every instance of competition in the Fairs of the various Institutes of this country, it has received the highest awards as "the best" in mechanism, usefulness, and economy. At the "World's Fair," London, 1851, in competition with thirty other varieties of artificial legs, (by the best artists in London and Paris,) it received the Prize Medal as the best. 48 10*

NORRIS WORKS, Norristown, Pa. The subscribers build and send to any part of the United States, Pumping, Hoisting, Stamping, and Portable Engines, and Mining Machinery of every description.
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PIG IRON—The subscriber has always on hand a stock of the best brands of American and Scotch Pig Iron, for sale at the lowest market price. G. O. ROBERTSON, 135 Water st, cor. Pine, N. Y. 1 8*

AARON KILBORN, No. 4, Howard street, New Haven, Ct., manufacturer of Steam Engines, Boilers, &c. Noiseless Fan Blower, a superior article, for smith's work, steam engines, brass and iron founders, and machinery in general. 51 10*

IRON FOUNDERS' MATERIALS, viz: Pulverized Sea Coal, Black Lead, Soapstone, Anthracite and Charcoal Facings. Also, best imported Fire Bricks, Fire Clay, Fire Sand, and Moulding Sand, for sale by
G. O. ROBERTSON,
1 8t* 135 Water street, corner of Pine.

ALDEN'S PATENT FAN BLOWER—Gives a stronger blast, with less power than any other.
2 6* J. B. CHICHESTER, Agent, 585 Broadway, N. Y.

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Scientific Museum.

Imponderable Agents.---No. 5.

Franklin, who might almost be called the discoverer of electricity, after years of patient research, adopted and gave to the world the theory, which, with some modifications not in the least contradictory, we have given in our last article. We are well aware that the weight of authority is with the the theory of Du Fay, but we adopt that of Franklin because in our opinion it is capable of explaining equally well with the other all electrical phenomena, and also because it is most consistant with analogy, and with the rule of Lord Bacon, that no more causes should be sought than are sufficient to produce the given effect.

The principal argument in favor of the theory of Du Fay, is derived from the fact that two pith balls negatively electrified will repel each other, and it has always been supposed that this could be explained satisfactorily by no other theory, because it was absurd to suppose that if the *presence* of more than the natural quantity of electricity in any body would produce repulsion, the *absence* of it would produce the same effect, but as we have stated, it is not repulsion which produces this effect, but the attraction of surrounding objects. The production of a burr on both sides of a sheet of card paper by the passage of the electric spark, has also been brought up as a proof of the passage of the fluid in both directions, but this we think is caused by the explosion or sudden expansion of the particles of air contained in the paper, in consequence of the passage of the spark.

The true test of any theory is the agreement between it and recognized fact, or in other words, the explanation it will give of natural phenomena, and by this rule let us try the theory we have given in our preceding article.

It has often been asked What is the nature of the light given off from terrestrial luminaries? We simply answer, that as the heat of combustion is the caloric, or Calorism as we term it, of combustion set free from the oxygen of the air at the moment of union with the combustible, so the light is nothing more than the combined Lumenism liberated in like manner.

Again, it is often asked, why are heat and electricity produced by friction? we reply that it is well known that compression produces heat, and when two bodies are rubbed together their parts must undergo alternate compression and expansion, hence they will give off heat and electricity also, at the point of contact, and again absorb these from the air at the moment of expansion. Particles of air compressed between the rubbing bodies also aid in producing this effect. Electricity when caused by friction then, is the result of the same action which caused heat under similar circumstances, but in order to collect the electricity, one of the rubbing bodies must be a non-conductor, otherwise it will be conveyed away as fast as produced. Again, it is well known that a locomotive, if insulated, will produce an immense amount of electricity; this has been erroneously explained by calling it the effect of the friction of the steam upon its passages, but it is really negative electricity, consequent upon the Electrism taken up during the conversion of water into steam.

Again, why is heat produced by the passage of heat through an imperfect conductor, platina for instance? Simply because a large quantity of Electrism if accumulated in any body, forces from out its pores the Calorism previously contained therein, just as the forcing a quantity of water into the pores of a sponge would expel the air contained in them. Electricity is self-repellent, and is usually found only at the surfaces of bodies, but when a quantity far greater than is capable of accumulating upon the surface is suddenly thrown upon a body, it will permeate its pores.

But why are trees shivered in pieces by a stroke of lightning? Simply because a powerful shock of electricity is capable of suddenly expanding particles of air and of converting water into steam, hence whatever air or moisture is contained in the tree is expanded suddenly and thus rends in pieces the wood.

(To be Continued.)

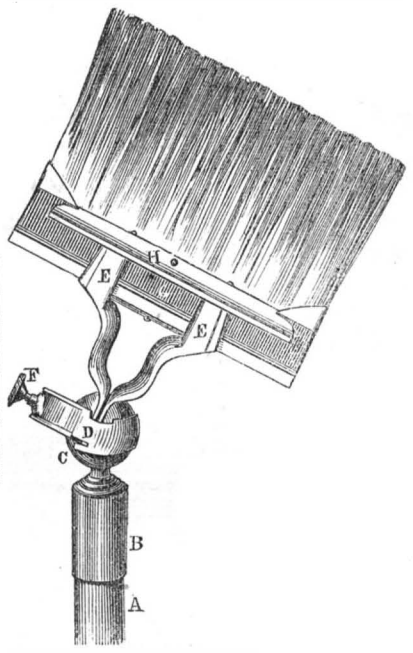
Coke in Locomotives.

An attempt has been made on the New York and New Haven railroad to substitude coke for wood as a fuel for locomotives. It was found that it was impossible to generate steam with sufficient rapidity by means of coke, causing the train to get behind time, and wood is now used as before. This result is not considered altogether decisive, as the firemen were ignorant of the proper mode of using coke, and the trial will probably be repeated. Coke is used almost exclusively in England, and anthracite in Pennsylvania, with success.

The furnaces will have to be altered, for those used for burning wood in locomotives are different from those of the coke burning engines.

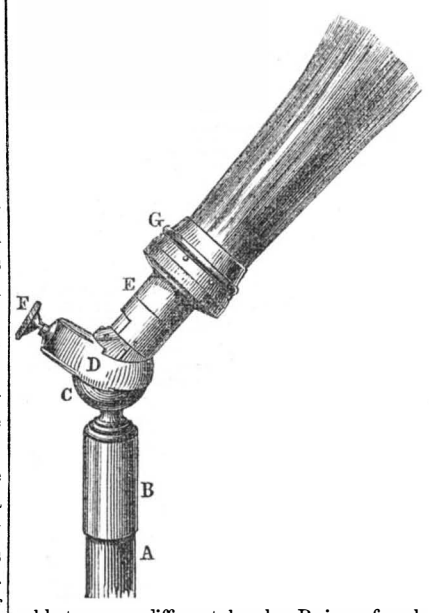
Improved Brushes.

FIG. 1.



The illustrations on this page are views of an invention of Freeman Murrow, 90 Meserole street, Williamsburgh, L. I., patented April 27, 1852. Figure 1 is a white wash brush, and figure 2 a paint brush. The invention consists in attaching the brush to the handle by a ball and socket joint, C D, which may be held firmly in any position by the set screw, F, and also in forming a slide, E H, in the white-wash brush, and a similar arrangement in the paint brush, by means of which the brush, G, may be changed when worn out, or when it is desi-

FIG. 2.



rable to use a different brush; B is a ferrule into which is placed the wooden handle, A.—This is certainly an excellent invention, and all those having occasion to use the articles will readily appreciate its advantages. Further information can be obtained from the inventor.

The Logotype.

We have received a communication from W. C. Phillips, of Sommerville, Tenn., who also sends us a communication of his to the "Memphis Whig," in relation to the new mode of printing of Major Beniowiski, described on page 32, this Vol., "Scientific American," By the article in the "Whig," we learn that Mr. Phillips has applied for a patent, and his claims are simply for "the employment of type consisting of words and syllables, instead of individual letters." This is not Major Beniowiski's invention, neither is it claimed by him, for the logotype was used sixty years ago, and had Mr. Phillips been a constant reader of the "Scientific American" for the past five years, he would have been spared the expense and trouble of applying for a patent. This kind of type has been successfully employed by Mr. Tobitt, of this city, in his printing office since 1849. We believe he applied for a patent, but according to our laws, it could not be granted, as the logotype was but the introduction of a system be fore used and described. He, however, deserves great credit for the faithful testing of this kind of type.

American Institute.

The Fair of the American Institute closed at Castle Garden, on Wednesday, Oct. 26th. The attendance this year has been very slender, notwithstanding the number of strangers now in the city, a greater number probably than were ever present at any of its previous fairs. Yet in the face of all their difficulties, the Directors have done their duty faithfully, having awarded a large number of prizes to the exhibitors. We notice 10 Gold Medals, 8 Silver Cups, 9 Webster's Dictionaries, over 100 Silver Medals, and 250 Diplomas.

We perceive that the remembrance of their manifold transgressions, and their numerous derelictions from duty, together with the experience they have now had, and the fearful consequences of public disapprobation, have at length brought them upon the stool of penitence. Gen. Chandler, in his speech at the close of the Fair, said—"With regard to the character of the exhibition, and the way in which the arrangements have been conducted, you will excuse me, at this time, if I say that silence best become us." Surely the General, when he said that, must have had the railroad prizes of last year in his mind's-eye, or he never would have made the humiliating confession. But it is sufficient for us that they have been brought to a realizing sense of their shortcomings, and trusting that present penitence will produce future amendment, we assure them that we shall hereafter labor heartily with them in their endeavors to make the American Institute what it should be—the Exponent of American Industry.

Gas Explosions.

Two serious explosions of gas have recently taken place, one in this city in the house of Dr. Griswold, and the other in the city of Troy, N. Y.,—they demand a few remarks. In both cases the gas burners had either been left open, or the pipes leaked, by which a great quantity of gas escaped and mingled with the atmosphere. The escape of the gas was detected by its odor, and in both of the cases a light was injudiciously used to search for the leakage of the gas, which was no sooner brought in contact with the gas than the explosion took place.

The gas used for common illumination, is endowed with the quality of giving a sensible warning of danger by its odor. In cases of the kind mentioned, no light should have been employed in searching for the leakage. The windows should have been thrown open until the smell had become very feeble, when a light could have been safely used in searching for the leak. This gas is not explosive in itself, but becomes so when it mixes with about seven or eight volumes of the atmosphere. It will neither explode when combined with too little or too much of the oxygen of the atmosphere, hence it can always be used with safety by those who are acquainted with these facts. We hope these remarks will be extensively circulated, as they may be the means of preventing some accidents of the kind we have mentioned, and thereby save the lives of some who may be near and dear to our readers.

Artesian Wells.

We have received a letter from a correspondent in Buxton, Canada West, upon the subject of artesian and other wells. His place of residence lies between lakes Erie and St. Clair, the soil of which is boulder clay from 50 to 100 feet deep; there are no natural springs there, and although the people can obtain water by digging 20 or 30 feet deep, it is of a brackish character, namely, impregnated with sulphate of iron, carbonate of lime, magnesia, and glauber salts.—This water is not good either for washing or domestic use, and our correspondent wishes to know if good water could be obtained by boring an artesian well. We are not particularly acquainted with the geological characteristics of this district, for we have merely seen it, and that but once, consequently we can give no advice about an artesian well. The peculiar geological characteristics of any locality in which artesian wells may be safely bored are described in the earlier numbers of Vol. 8, "Scientific American." The most economical way to obtain good domestic water in Buxton, is to collect and filter the rain water, as the water in the wells is nothing more nor less than the rain water, which has passed from the surface, and taken up the salts from the soil in its passage downwards.

Puffing New Inventions.

We frequently receive from inventors written descriptions of some real or fancied improvement, lauding their inventions to the skies, in terms which we never apply to any invention, still less to those which are thus described; for it too frequently happens that the very inventions thus extolled are those possessing least merit. We do not believe there ever was an inventor who did not consider his as the greatest invention of the day, and hence, if they set about giving an opinion as to the merits of their machines, they almost invariably get into the sublime. Now we are always glad to receive from inventors full descriptions of their improvements, and we are willing they should state what they claim as the advantages of them; but we want it should be distinctly understood that we cannot be induced, from any consideration whatever, to publish any such articles as those we refer to. Inventors wishing such puffs must go the daily papers, where, for a few dollars, they can get almost any thing printed they may choose to write. The "Scientific American" will give an honest opinion respecting the merits of inventions, and we are satisfied that the very inventors who would condemn us for applying this rule to their own inventions, would applaud us for applying it to others.

MECHANICS

Manufacturers and Inventors.

The present Volume of the SCIENTIFIC AMERICAN commences under the most gratifying assurances, and appearances indicate a very marked increase to the subscription list. This we regard as a flattering testimonial of the usefulness and popularity of the publication so generously supported. We are greatly indebted to our readers for much valuable matter, which has found a permanent record on its pages. The aid thus contributed has been most important to our success, and we are grateful for it.

From our foreign and home exchanges—from the workshops, fields, aud laboratories of our own country, we have supplied a volume of more than four hundred pages of useful information, touching every branch of art, science, and invention, besides hundreds of engravings executed by artists exclusively in our employ.

The present Volume will be greatly improved in the style and quantity of the Engravings, and in the character of the matter, original and selected. Having every facility for obtaining information from all parts of Europe, we shall lay before our readers, in advance of our cotemporaries, a full account of the most prominent novelties brought forward.

The opening of the Crystal Palace in this city, forms an interesting subject for attraction. We shall study it faithfully for the benefit of our readers, and illustrate such inventions as may be deemed interesting and worthy.

The Scientific American is the Repertory of Patent Inventions: a volume, each complete in itself, forms an Encyclopedia of the useful and entertaining. The Patent Claims alone are worth ten times the subscription price to every inventor.

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